

Prepared For:
---------------

United States Department of Energy

# Congestion Analysis of the Eastern Interconnection: Simulation Results

#### Prepared By:

**CRA** International

50 Church Street

Cambridge Massachusetts 02138

July 20, 2006

## Task 1

March 15, 2006 Draft								
TABLE 1 - EXISTING STUDIES - DOE Task 1 SUMMARY OF EASTERN INTERCONNECTION CONGESTION AREAS								
Congestion Area Path Number & Name or Map Reference Number	Study / Template	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings			
New Brunswick to Maine Le Preau to Orrington	ISO-NE Regional System Plan 2005	2005 thru 2014	Observed - historical congestion Modeled - Power flow, voltage stability, therma limits, Loss of Load Expectation (LOLE)	NERC and regional reliability standards	Northeast Reliability Interconnect Project—adds a new 345 kV tie line between New England and New Brunswick to improve the transfer capability between the two regions by 300 MW and improve system performance in northern Maine. The projected in-service date for this project is December 2007. Specific methodology for validating project not stated.			
	Northeast Coordinated System Plan: 2005	2005	Observed - historical congestion	N/A	Siting approval was to be completed in October 2005.			
	ISO-NE Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	1935 hours constrained at Orrington			
Southwest Connecticut	ISO-NE Regional System Plan 2005	2005 thru 2014	Observed - historical congestion Modeled - Power flow, voltage stability, thermal limits, Loss of Load Expectation (LOLE)		Southwest Connecticut Reliability—improves the transfer of power and system performance in Southwest Connecticut via 345 kV.  * Phase 1 is currently under construction and will increase the import capability by 275 MW with a projected in-service date of December 2006.  * Phase 2 is currently in the final design and analysis stage and will increase the import capability by 825 MW with a projected in-service date of December 2009.  Specific methodology for validating project not stated.			
	Northeast Coordinated System Plan: 2005	2005	Observed - historical congestion	N/A	Siting approval completed.			
	ISO-NE Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2947 hours constrained at Norwalk-Stamford in Connecticut			

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or Map Reference Number	Study / Template (See Template for additional details)	Time Frame	(Observed / Modeled)		
	ISO-NE Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	1154 hours constrained at Norwalk-Stamford in Connecticut
Maine to New Hampshire North South Interface (Scobie)	ISO-NE Regional System Plan 2005	2005 thru 2014	Observed - historical congestion Modeled - Power flow, voltage stability, thermal limits, Loss of Load Expectation (LOLE)	NERC and regional reliability standards	The ISO is conducting analyses to identify upgrades that will increase the transfer capabilities of the northern New England interfaces and reduce operational complexity by reducing the interdependencies of specific generators on the transfer capability  * Closing the Y-138 line.  * Adding a 500–600 MVAR static compensator to provide dynamic voltage control at the Deerfield 345 kV Substation.  * Eliminating critical Buxton 345 kV contingencies resulting from the failure of key circuit breakers to operate.  * Looping Section 391 into the Deerfield 345 kV Substation.  * Upgrading 115 kV facilities near the southern Maine–New Hampshire border.  * Adding capacitor banks in western Maine and at Maxcy's. Specific methodology for validating project not stated.
	ISO-NE Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	* 1660 hours constrained on northern New England Scobie in New Hampshire * 1167 hours constrained on North-South Interface
	ISO-NE Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	* 716 hours constrained on northern New England Scobie in New Hampshire * 252 hours constrained on North-South Interface
Into Boston	ISO-NE Regional System Plan 2005	2005 thru 2014	Observed - historical congestion Modeled - Power flow, voltage stability, thermal limits, Loss of Load Expectation (LOLE)	NERC and regional reliability standards	NSTAR 345 kV Reliability Project—increases the transfer limits into the Greater Boston area. NSTAR has commenced construction. The projected in-service date is June 2006 for the first two cable circuits and summer 2008 for the third cable. The first two cables will increase the import capability by 900 MW and the third cable by another 200 MW. Specific methodology for validating project not stated.
	Northeast Coordinated System Plan: 2005	2005	Observed - historical congestion	N/A	Siting approval completed.

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or	Study / Template	Time	(Observed / Modeled)		
Map Reference Number	(See Template for additional details)	Frame			
	ISO-NE Day Ahead	2004 thru		Number of hours constrained	1466 hours constrained on lines into Boston
	Constraints	2005	hourly recorded data		
	ISO-NE Real Time	2004 thru	Observed - Analysis of	Number of hours constrained	202 hours constrained on lines into Boston
	Constraints	2005	hourly recorded data		
	ISO-NE Regional	2005 thru	Observed - historical	NERC and regional reliability	Solutions for reliability issues still under study.
England	System Plan 2005	2014	congestion  Modeled - Power flow,	standards	
			voltage stability, thermal		
			limits, Loss of Load		
			Expectation (LOLE)		
	Northeast Coordinated	2005		N/A	Siting approval complete in January 2008.
	System Plan: 2005		congestion		
	ISO-NE Day Ahead	2004 thru		Number of hours constrained	926 hours constrained on lines from the east to west and vice
	Constraints	2005	hourly recorded data		versa servicing Southern New England.
	ISO-NE Real Time	2004 thru		Number of hours constrained	228 hours constrained on lines from the east to west and vice
	Constraints	2005	hourly recorded data		versa servicing Southern New England.
	ISO-NE Regional	2005 thru 2014	Observed - historical	NERC and regional reliability standards	Northwest Vermont Reliability Project—improves the Vermont Electric Power Company's (VELCO) 345 kV and 115 kV
	System Plan 2005	2014	congestion  Modeled - Power flow,	standards	transmission system for the major load center in northwestern
			voltage stability, thermal		Vermont. VELCO has commenced construction, is preparing
			limits, Loss of Load		the final design, and is analyzing project modifications. The
			Expectation (LOLE)		projected in-service dates for individual stages of the project
					range from May 2006 through October 2007. Specific methodology for validating project not stated.
	Northeast Coordinated System Plan: 2005	2005	Observed - historical congestion	N/A	Siting approval completed.
	•		-		
	ISO-NE Day Ahead	2004 thru		Number of hours constrained	1584 hours constrained on Highgate
	Constraints	2005	hourly recorded data		

Congestion Area Path Number & Name or Map Reference Number	Study / Template	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
Map reserve ramber	additional details)	Trumo			
Flows from Western to Eastern NY (Central East and Total	NYISO 2004 Transmission Performance Report	2001 thru 2004	Observed - Analysis of hourly recorded data	Simultaneous interface constraints	Noted as area of constraint.
East Interface)	NYISO Operating Study Winter 2005- 2006		Modeled - power flow and thermal transfer limits	NERC and regional reliability standards	Noted that Central East and Total East limits have decreased.
	NYISO 2004 State of the Market Report	2004	Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
	New York Independent System Operator Electric System Planning Process Initial Planning Report	2003	Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
	NYISO Real Time Constraints	2004 thru 2005	<b>Observed</b> - Analysis of hourly recorded data	Number of hours constrained	5808 hours constrained on Central East Interface
	NYISO Day Ahead Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	1389 hours constrained on Central East 735 hours constrained on Pleasant Valley-Leeds
Westchester to NYC (Sprainbrook -	NYISO 2004 Transmission Performance Report	2001 thru 2004	Observed - Analysis of hourly recorded data	Simultaneous interface constraints	Noted as an area of constraint.  Installation of the 345 kV fault-current limiting series reactors at the Sprain Brook 345 kV station.
Dunwoodie South Interface: Sprainbrook- Dunwoodie South, W. 49th St. 345 kV, Rainey	NYISO 2004 State of the Market Report		hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
to Dunwoodie 345 kV, Rainey to Vernon 345 kV)	New York Independent System Operator Electric System Planning Process Initial Planning Report		Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
	NYISO Real Time Constraints		<b>Observed</b> - Analysis of hourly recorded data	Number of hours constrained	4476 hours constrained Sprainbrook-Dunwoodie South

Congestion Area Path Number & Name or Map Reference Number	Study / Template (See Template for additional details)	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
	NYISO Day Ahead Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	* 4427 hours constrained on Rainey-Vernon * 2877 W49th to Sprain Brook * 2142 Rainey-Dunwoodie
Flows from Northern NY (Moses South Interface: Massena to	NYISO Operating Study Winter 2005- 2006	2005-2006	Modeled - power flow and thermal transfer limits	NERC and regional reliability standards	Noted that the Moses South interface limit has decreased.
Marcy, Moses to Adirondack)	NYISO Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	61 hours constrained on Marcy 765/345 kV
	NYISO Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	1753 hours constrained on Marcy 765/345 kV
Flows into Western NY (Dysinger East Interface: AES	NYISO Real Time Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	5337 hours constrained on Dysinger East Interface
	NYISO Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	820 hours constrained on Dysinger East Interface
Flows into Central NY (West Central Interface: Pannell Road to Clay,	NYISO Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	3910 hours constrained on West-Central Interface
	NYISO Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	47 hours constrained on West-Central Interface
Westchester to Long Island (Coned-LIPA Interface: Dunwoodie to Shore Road, Sprain Brook to East Garden City)	NYISO 2004 State of the Market Report	2004	Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.

Congestion Area Path Number & Name or Map Reference Number	Study / Template (See Template for additional details)	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
	New York Independent System Operator Electric System Planning Process Initial Planning Report		Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
	NYISO Real Time Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	9412 hours constrained on Dunwoodie-Shore Road
	NYISO Day Ahead Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	11,428 hours constrained on Dunwoodie-Shore Road 757 hours constrained Dunwoodie 345/138 kV
Flows into NY Metro Region (UPNY-Coned Interface: Ladentown to	NYISO 2004 State of the Market Report	2004	hourly recorded data	Analysis of real-time congestion	
Buchanan South, Pleasant Valley to Wood St., Pleasant Valley to E. Fishkill, Pleasant Valley to Millwood, Roseton to E.	New York Independent System Operator Electric System Planning Process Initial Planning Report		Observed - Analysis of hourly recorded data	Analysis of real-time congestion	Noted as area of constraint.
Fishkill, Ramapo to Buchanan North)	NYISO Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2014 hours constrained on UPNY-Coned
	NYISO Day Ahead Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	421 hours constrained on UPNY-Coned
144 AM 1 1 1	D IM Devile	0005 :1		NEDO sed resistant at 11 1111	No second test consistency and the test consistency are the test consistency and the test consistency and the test consistency and the test consistency and the test consistency are the test consis
- Bedington-Black Oak	PJM Regional Transmission Expansion Plan 2005	2010	Modeled - power flow	NERC and regional reliability standards	No quantitative analysis provided.  Bedington-Black Oak in feasibility study  Mt. Storm upgrade in engineering/ procurement stage.
and APS South (Doubs- Mt. Storm 500 KV line and Meadowbrook Mt. Storm 500)	The Trans-Allegheny Interstate Line Project: A 500 kV Transmission Line Through the AP Zone	2010	<b>Modeled</b> - power flow	Increase in west-to-east transfer capability	Proposal would increase transfer capability by 3800 MW over base case levels.

Congestion Area Path Number & Name or Map Reference Number	Study / Template (See Template for additional details)	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
	PJM Real Time Constraints	2004 thru 2005	<b>Observed</b> - Analysis of hourly recorded data	Number of hours constrained	3268 hours constrained on Bedington-Black Oak 60 hours constrained on APS South
	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	6831 hours constrained on Bedington-Black Oak 436 hours constrained on APS South
	Other Project Development Status Notes				* AEP's proposed Project Mountaineer 765 kV line would alleviate congestion on Bedington-Black Oak and APS South. Allegheny's 500 kV proposed line would do the same.
Central PA to Eastern PA (PJM Western Interface: Keystone &	PJM Regional Transmission Expansion Plan 2005	2010	Modeled - power flow	NERC and regional reliability standards	PECO to upgrade Peach Bottom 500kV XFMr by 4Q 2007.
Conemaugh - Juniata, Conemaugh - Hunterstown, Doubs-	PJM Real Time Constraints	2005	hourly recorded data	Number of hours constrained	<ul><li>331 hours constrained on Keystone</li><li>140 hours constrained on Hunterstown</li><li>31 hours constrained on Conemaugh</li></ul>
Brighton, Conastone- Peachbottom)	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	1027 hours constrained on Keystone 53 hours constrained on Hunterstown
Eastern PA to New Jersey (PJM Eastern Interface: Wescosville &	PJM Regional Transmission Expansion Plan 2005	2010	Modeled - power flow	NERC and regional reliability standards	PECO to upgrade Peach Bottom 500kV XFMr by 4Q 2007. Replace wave trap at Alburtis 500kV substation by 6/1/2008.
Juniata-Alburtis, TMI- Hosensack, Peach Bottom - Limerick,	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	420 hours constrained
Peach Bottom-Keeney)	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2686 hours constrained
Branchburg Transformer	PJM Regional Transmission Expansion Plan 2005	2010	Modeled - power flow	NERC and regional reliability standards	Replace all de-rated Branchburg 500/230 kV transformers by 1/1/2007. Proposed at Branchburg substation to replace wave trap on Branchburg - Readington 230kV circuit.
	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	1772 hours constrained on Branchburg Transformer

Congestion Area Path Number & Name or	Study / Template	Study Time	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
Map Reference Number	(See Template for additional details)	Frame			
	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	894 hours constrained on Branchburg
PJM to New York City - Hudson to Farragut, Linden to Goethals	-PJM Regional Transmission Expansion Plan 2005	2005 thru 2010	Modeled - power flow	NERC and regional reliability standards	PSEG to replace Hudson 230kV circuit breakers #1-2, relocate the X-2250 circuit from Hudson 1-6 bus to Hudson 7-12 bus, replace Hudson 230 KV breaker BS2-3, Replace Linden 230 KV breaker#1-5, #1-3, #2-3, BS5-6, and BS2-6 in 2006
	NYISO Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	144 hours constrained on Hudson-Farragut 100 hours constrained on Linden-Goethals
Ohio to West Virginia and Pennsylvania Wylie Ridge-Kammer	PJM Real Time Constraints	2005	hourly recorded data	Number of hours constrained	4382 hours constrained on Kammer and Wylie Ridge
, ,	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2065 hours constrained on Kammer and Wylie Ridge
	PJM Regional Transmission Expansion Plan 2005	2005 thru 2010	Modeled - power flow	NERC and regional reliability standards	Installed SPS at Wylie Ridge as of 3/31/2005. Proposal to install third Wylie Ridge 500/345kV transformer.
	PJM TLR	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours above TLR level 3a	3537 hours on Wylie Ridge 1381 hours on Kammer
	MISO Real Time Constraints	04/05 thru 12/05	Observed - Analysis of hourly recorded data	Number of hours constrained	1095 hours constrained on Kammer 370 hours constrained on Wylie Ridge
	MISO Day Ahead Constraints	04/05 thru 12/05	Observed - Analysis of hourly recorded data	Number of hours constrained	262 hours constrained on Wylie Ridge and Kammer
Illinois to Indiana Crete-St. Johns Tap, Dune Acres-Michigan	Midwest ISO Transmission Expansion Plan 2005	2009	Modeled - Power flow, voltage stability, therma analyses		Both 138 kV circuits from Dune Acres to Michigan City are planned for reconductor to 186 MVA capacity in 2005
City, State Line-Wolf Lake	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2008 hours constrained on Crete-St. John's 160 hours constrained on Dune Acres-Michigan 94 hours constrained on State Line-Wolf Lake

Congestion Area Path Number & Name or	Reference Study / Template	Study Time	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
Map Reference Number		Frame	(Observed / Nodeled)		
	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	332 hours constrained on Crete-St. John's, Dune Acres- Michigan, and State Line-Wolf Lake
Central PA to Central NY Homer City- Watercure, Homer City	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	39 hours constrained on Homer City-Watercure 199 hours constrained on Homer City 345/230kV
345/230kV	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	2599 hours constrained on Homer City-Watercure 1090 hours constrained on Homer City 345/230kV
NW Pennsylvania to W. New York Erie West to Erie South,	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	270 hours constrained on Erie Xfmrs/lines.
Erie E. to Erie SE 230 kV	PJM Day Ahead Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	628 hours constrained on Erie Xfmrs/lines.
West Virginia to Southern Virginia Kanawha-Matt Funk	PJM Real Time Constraints	2004 thru 2005	Observed - Analysis of hourly recorded data	Number of hours constrained	101 hours constrained on Kanawha-Matt Funk
Traina Watt Turk	PJM Day Ahead Constraints		Observed - Analysis of hourly recorded data	Number of hours constrained	19 hours constrained on Kanawha-Matt Funk
North Carolina to Southern Virginia	VEM Winter 05/06	Winter 05/06	<b>Modeled</b> - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Noted as an area of constraint.
	VEM Summer 2005	05	voltage stability, thermal analyses		Noted as an area of constraint.
	VASTE 2005 Summer Reliability Study of Projected Operating Conditions	Summer 05	<b>Modeled</b> - Power flow, voltage stability, therma analyses	NERC and regional reliability standards	Noted as an area of constraint.

4:-h+ 100				
Transmission Expansion Plan 2005	2009	voltage stability, thermal analyses	standards	The Michigan—Ontario interface was a significant limitation to transfers, particularly transfers involving Ontario. ITC is developing some conceptual plan, e.g., HVDC, to address this issue.
Michigan Exploratory Study, Preliminary Study Report (Draft) October 2005	2011	Modeled - Power flow	Loss of Load Expectation (LOLE)	Evaluates two options for alleviating transfers across Michigan to Ontario. Further analysis still required.
Transmission Expansion Plan 2005	2009	voltage stability, thermal analyses	standards	New transmission lines and conversion options are being studied by MISO
CapX 2020 Technical Jpdate: Identifying Minnesota's Electric Fransmission Infrastructure Needs	2009-2020			Study provides possible transmission solutions to serve load centers in Minnesota with planned generation in Dakotas, Iowa, Southern Minnesota, and Wisconsin.
	2005 thru 2009	voltage stability, thermal	, -	Arrowhead-Weston 345 kV line is a pending improvement for 2008
CapX 2020 Technical Jpdate: Identifying Minnesota's Electric Transmission nfrastructure Needs	2009-2020	Modeled - Power flow,		Study provides possible transmission solutions to serve load centers in Minnesota with planned generation in Dakotas, Iowa, Southern Minnesota, and Wisconsin.
	04/05 thru 12/05	Observed - Analysis of hourly recorded data	Number of hours constrained	882 hours constrained on Eau Claire-Arpin
	04/05 thru 12/05	hourly recorded data		650 hours constrained on Eau Claire-Arpin
	2004 thru 2005			1731 TLR hours on Eau Claire-Arpin
	ichigan Exploratory tudy, Preliminary tudy, Preliminary tudy Report (Draft) october 2005  lidwest ISO ransmission xpansion Plan 2005 rapX 2020 Technical pdate: Identifying linnesota's Electric ransmission frastructure Needs  lidwest ISO ransmission frastructure Needs  lidwest ISO ransmission xpansion Plan 2005 rapX 2020 Technical pdate: Identifying linnesota's Electric ransmission xpansion Plan 2005 rapX 2020 Technical pdate: Identifying linnesota's Electric ransmission frastructure Needs  IISO Real Time constraints	lidwest ISO ransmission xpansion Plan 2005  lichigan Exploratory tudy, Preliminary tudy Report (Draft) october 2005  lidwest ISO ransmission xpansion Plan 2005  rapX 2020 Technical pdate: Identifying linnesota's Electric ransmission frastructure Needs  lidwest ISO apX 2020 Technical pdate: Identifying linnesota's Electric ransmission frastructure Needs  lidwest ISO apX 2020 Technical pdate: Identifying linnesota's Electric ransmission xpansion Plan 2005 apX 2020 Technical pdate: Identifying linnesota's Electric ransmission frastructure Needs  IISO Real Time onstraints  04/05 thru 12/05  IISO Day Ahead onstraints  2009  2009-2020 04/05 thru 12/05	Ididwest ISO ransmission xpansion Plan 2005  Ilichigan Exploratory tudy, Preliminary tudy Report (Draft) october 2005  Ididwest ISO ransmission xpansion Plan 2005  Ididwest ISO ransmission xpansion Pla	lidwest ISO ransmission xpansion Plan 2005  lichigan Exploratory tudy, Preliminary tudy Report (Draft) kitober 2005  lidwest ISO ransmission xpansion Plan 2005  lidwest Iso ransmission relation (LoLE)  Modeled - Power flow, voltage stability, thermal analyses  limesota's Electric ransmission ransmission ransmission plan 2005  lidwest ISO ransmission ransmission plan 2005  lidwest ISO ransmission ransmission ransmission plan 2005  lidwest ISO ransmission ransmission ransmission plan 2005  lidwest ISO ransmission plan 2005  lidwest ISO ransmission ra

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or	Study / Template	Time	(Observed / Modeled)		
Map Reference Number	(See Template for	Frame			
	additional details)				
Upper Peninsula	Midwest ISO			NERC and regional reliability	1) Rebuilding double circuit Plains-Amberg 138 kV line,
Michigan to Wisconsin	Transmission	2009	voltage stability, therma	standards	construct, rebuild and convert the 69 kV & 138 kV line from
Flow South	Expansion Plan 2005		analyses		West Marinett to
					Amberg as a 138 kV line with portions double circuited with a
					69 kV line. Complete in 2005.
					2) Uprate Morgan–White Clay 138 kV. Complete in 2005.
					3) Rebuild Morgan–Stiles 138 kV. Complete in 2005.
					4) Uprate North Appleton–White Clay 138 kV. Complete in 2005.
					5) Considering adding a series reactor to the Highway
					V–Preble 138 kV line. Complete in 2005.
					6) Construct a 345 kV line from a new Werner West SS to
					Morgan. Complete in 2009.
	TLRs		Observed - historical	Number of hours above Level	3,749 hours above 3a on Flow South
		2005	TLRs	3a	
Illinois and lowa to	Midwest ISO		Modeled - Power flow,	NERC and regional reliability	Ranked 21st in TLRs
Wisconsin Paddock	Transmission	2009	voltage stability, therma	standards	Constructed Wempleton–Paddock 345 kV circuit #2 as of 2005
Transformer	Expansion Plan 2005	0004 th	analyses	Niverbar of barres above I arrel	042 have above 25 as Daddadh
	TLRs		Observed - historical	Number of hours above Level	243 hours above 3a on Paddock
	MISO Real Time	2005 2005	TLRs Observed - Analysis of	Number of hours constrained	40 hours constrained on Daddock
	Constraints	2005		Number of nours constrained	42 hours constrained on Paddock
	Constraints		hourly recorded data		
	MISO Day Ahead	04/05 thru	Observed - Analysis of	Number of hours constrained	449 hours constrained on Paddock
	Constraints	12/05	hourly recorded data	Trumber of mours constrained	1449 Hours constrained of F addock
	Constraints	12/00	Tiodity recorded data		
W. Nebraska to W.	TLRs	2004 thru	Observed - historical	Number of hours above Level	765 hours above 3a on Gentlemen-Red Willow
Kansas Gentleman-		2005	TLRs	3a	
Red Willow	MISO Real Time	2005	Observed - Analysis of	Number of hours constrained	210 hours constrained on Gentlemen-Red Willow
	Constraints		hourly recorded data		
LGE System Blue	Midwest ISO		Modeled - Power flow,	NERC and regional reliability	Proposed Mill Creek–Hardin County 345 kV line, a part of
Lick 345 k/161/ Xfmr,	Transmission	2009	voltage stability, therma	standards	Trimble County Outlet #2 project for completion in 2009.
Frankfort to East-	Expansion Plan 2005	22244	analyses		
Tyrone 138 kV	TLRs	2004 thru	Observed - historical	Number of hours above Level	362 hours above 3a for Frankfort to East Tyrone
		2005	TLRs	3a	223 hours above 3a for Blue lick

Congestion Area Path Number & Name or Map Reference Number	Study / Template (See Template for additional details)	Study Time Frame	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
	MISO Day Ahead Constraints	04/05 thru 12/05	Observed - Analysis of hourly recorded data	Number of hours constrained	1099 hours constrained on Frankfort to East Tyrone 154 hours constrained on Blue Lick
	MISO Real Time Constraints	04/05 thru 12/05	Observed - Analysis of hourly recorded data	Number of hours constrained	1023 hours constrained on Frankfort to East Tyrone 1810 hours constrained on Blue Lick
Wisconsin Stiles- Amberg and Crivitz 138 kV, Kewaunee 345/138 Xfmr, Highway-Preble 138 kV		2005 thru 2009	Modeled - Power flow, voltage stability, therma analyses	NERC and regional reliability standards	1) Rebuilding double circuit Plains—Amberg 138 kV line, construct, rebuild and convert the 69 kV & 138 kV line from West Marinett to Amberg as a 138 kV line with portions double circuited with a 69 kV line in 2005.  2) Rebuild the Stiles—Amberg double circuit 138 kV line in 2006.  3) Installed a series reactor on the Highway V - Preble 138 kV line in 2005.
	TLRs	2004 thru 2005	Observed - historical TLRs	Number of hours above Level 3a	711 hours above 3a for Highway-Preble
	MISO Real Time Constraints	2005	Observed - Analysis of hourly recorded data	Number of hours constrained	310 hours constrained on Highway-Preble
	MISO Day Ahead Constraints	2005	Observed - Analysis of hourly recorded data	Number of hours constrained	669 hours constrained on Stiles 606 hours constrained on Highway-Preble 152 hours constrained on Amberg
Miami Fort 345/138 kV	Midwest ISO Transmission Expansion Plan 2005	2005 thru 2009	Modeled - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Upgrade Miami Fort–345 / 138 ckt 2
	TLRs	2004 thru 2005	Observed - historical TLRs	Number of hours above Level 3a	445 hours above 3a on Miami Fort
	MISO Day Ahead Constraints	2005	Observed - Analysis of hourly recorded data	Number of hours constrained	118 hours constrained on Miami Fort
	MISO Real Time Constraints	2005	Observed - Analysis of hourly recorded data	Number of hours constrained	163 hours constrained on Miami Fort

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or	Study / Template	Time	(Observed / Modeled)		3.
Map Reference Number		Frame			
	additional details)				
Illinois to Kentucky	2005 MAIN			NERC and regional reliability	Noted as an area of constraint.
	Summer Transmission	05	voltage stability, thermal	standards	
	Assessment Study		analyses		
W. Oklahoma to W.	SPP RTO Expansion	2005 thru	Modeled - Power flow	NERC and regional reliability	Replace free standing metering CT at Elk City
Texas Elk City	Plan	2010	voltage stability, thermal		Tropiace need standing metering of at Lin eng
230/138 kV			analyses		
Transformer					
Central Oklahoma	SPP RTO Expansion		Modeled - Power flow,	NERC and regional reliability	Installed two 25 Mvar 345 kV reactors at Arcadia in march
Redbud-Arcadia 345 kV	Plan	2010	voltage stability, thermal	standards	2005.
	000 4 4 4	E	analyses		2447 2 224
	SPP Analysis			MW Curtailed; Firm Requests	9145; 8.2%
	TLRs	of 2005	data	Refused (%) Number of hours above Level	109 hours above 3a on Redbud-Arcadia 345 kV
	ILKS	2004 thru 2005	Observed - historical	Number of hours above Level	109 hours above 3a on Redbud-Arcadia 345 kV
		2005	TLRs	Ja	
Southeast Oklahoma	SPP Analysis	First 3Qs	Observed - historical	MW Curtailed; Firm Requests	1488; 9.4%
Valliant-Lydia 345 kV	C	of 2005	data	Refused (%)	1.00, 0.17,0
and Pittsburg-Seminole	TLRs			Number of hours above Level	109 hours above 3a on Valiant-Lydia
345 kV		2005	TLRs	3a	,
Arkansas to	SPP Analysis		Observed - historical	Firm Requests Refused (%)	2.40%
Oklahoma Ft. Smith		of 2005	data		
500/345 kV	TLRs		Observed - historical	Number of hours above Level	39 hours above 3a on Ft. Smith 500/345 kV
Transformer		2005	TLRs	3a	
NE Kansas latan to	SPP Analysis	First 3Qs	Observed historical	MW Curtailed	32,526
Stranger Creek 345 kV	orr Analysis	of 2005	Observed - historical data	INIVY Curtailed	32,320
Stratiget Creek 343 KV		01 2003	uaia		
SE Missouri to NE	Entergy 2004 FERC	2004	Observed - historical		Noted as an area of constraint.
Arkansas	Form 715		data		
Central Arkansas to S.		2004	Observed - historical		Noted as an area of constraint.
Arkansas	Form 715		data		

Congestion Area Path Number & Name or	Study / Template	Study Time	Analytical Method (Observed / Modeled)	Criteria and Metrics Used	Status / Findings
Map Reference Number	(See Template for additional details)	Frame			
Into New Orleans	Entergy 2004 FERC Form 715	2004	Observed - historical data		Noted as an area of constraint.
SE Louisiana to W Louisiana	Entergy 2004 FERC Form 715	2004	Observed - historical data		Noted as an area of constraint.
NW Alabama to NE Mississippi McAdams 500/230 kV AutoXfmr	TLRs	2004 thru 2005	Observed - historical TLRs	Number of hours above Level 3a	1369 hours above 3a on McAdams 500/230 kV
Tennessee to Kentucky Volunteer to Sullivan	TLRs	2004 thru 2005	Observed - historical TLRs	Number of hours above Level 3a	823 hours above 3a for Volunteer
Flows into Western Tennessee Cumberland-Davidson, Johnsonville-Davidsor	TLRs	2004 thru 2005	Observed - historical TLRs	Number of hours above Level 3a	2010 combined hours above 3a on Cumberland-Davidson and Cumberland-Johnsonville
Tennessee to Georgia	VASTE 2005 Summer Reliability Study of Projected Operating Conditions	Summer 05	Modeled - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Noted as an area of constraint.
E. Georgia to E. Florida Southern FRCC Interface	Southern/ Florida Interface Study	2004 thru 2005	Modeled - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Noted as an area of constraint.
Eastern South Carolina	VASTE 2005 Summer Reliability Study of Projected Operating Conditions	Summer 05	Modeled - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Noted as an area of constraint.
Atlanta	VASTE 2005 Summer Reliability Study of Projected Operating Conditions	Summer 05	Modeled - Power flow, voltage stability, thermal analyses	NERC and regional reliability standards	Noted as an area of constraint.

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or	Study / Template	Time	(Observed / Modeled)		
Map Reference Number	(See Template for	Frame			
	additional details)				
Kansas/ Panhandle	Kansas/Panhandle Sub	2010-2011	Modeled - Power flow	Regional reliability criteria	Reviews transmission options for delivering low-cost wind and
	Regional Transmission				coal power northward from Iowa and Southern Minnesota
	Study				
			Modeled - Power flow	Regional reliability criteria	Reviews transmission options for delivering low-cost wind and
	Kansas/Panhandle Sub				coal power northward from Iowa and Southern Minnesota
	Regional Transmission				
	Study				
Dakotas	Iowa -Southern	2009	Modeled - Power flow	Regional reliability criteria	Examined possible routes for delivering low-cost coal and wind it
Dakotas		2009	wodeled - Power flow	Regional reliability criteria	the Dakotas east toward Minneapolis
	Minnesota Exploratory Study Presentation to				the Dakotas east toward Minneapolis
	NWCC				
	INVVCC				
	Buffalo Ridge	2007	Modeled - Power flow,	Regional reliability criteria	Suggested transmission upgrades include installing a Nobles Co-
	Incremental Generation		voltage stability, therma	, ,	Fenton 115 kV line, a 345/115 kV transformer at Nobles Co, a
	Outlet Transmission		analyses		Lake Yankton-Marshall SW 115 kV line, and shunt capacitors at
	Study		anaryooo		Panther, Lk Tankton, and Winnebago Jct.
	CapX 2020 Technical	2009-2020	Modeled - Power flow,	NERC and regional reliability	Study provides possible transmission solutions to serve load
	Update: Identifying		voltage stability, thermal		centers in Minnesota with planned generation in Dakotas, Iowa,
	Minnesota's Electric		analyses		Southern Minnesota, and Wisconsin.
	Transmission		•		
	Infrastructure Needs				
	Big Stone II Certificate	2005	Observed	N/A	Examined possible routes for delivering low-cost coal from Big
	of Need Application for				Stone II in South Dakota east toward Minnesota
	Transmission Lines in				
	Western Minnesota				
	0005 Min and 1	0000 0015		NI/A	
		2003-2015	Observed	N/A	Examined possible routes for delivering low-cost wind and coal in
	Biennial Transmission				the Dakotas east toward Minnesota
	Projects Report				

Congestion Area Path	Reference	Study	Analytical Method	Criteria and Metrics Used	Status / Findings
Number & Name or	Study / Template	Time	(Observed / Modeled)		
Map Reference Number	r (See Template for	Frame		/	
	additional details)	4			
	Dakotas Wind	2013	Modeled - Power flow,	NERC and regional reliability	Examined possible routes for delivering low-cost wind in the
	Transmission Study		voltage stability, thermal	standards	Dakotas east toward Minnesota
	Tasks 3 and 4 Final		analyses	'	
	Report: System Impact	.[	<b>'</b>	'	
	Study and Transfer	1	'	'	
	Capability Study	1	'	'	
			<u>'</u>		
Red Italics indicates prop	posed or planned improv	vement			





# **Regional Congestion**



#### **Regional Congestion**

- The following slides identify major points of congestion in the Eastern Interconnection based on market data, TLR data and RTO reports
- These are not congestion study results

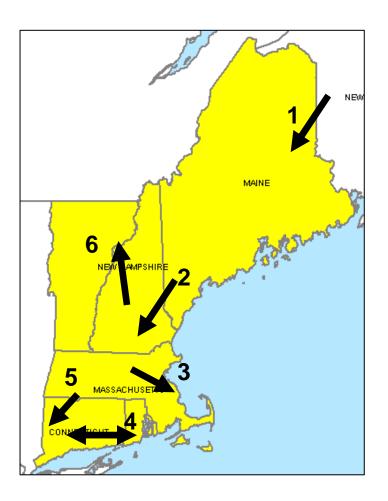


#### **ISONE**

- 1. New Brunswick to Maine
- 2. North-South Interface (or Maine-New Hampshire Interface)
- 3. Boston Import
- 4. Southern New England East-West Flows
- 5. Southwest Connecticut
- 6. Flows into Northwestern Vermont



## **ISONE**



- Constraint arrows point from resource to direction of load
  Numbers serve as reference to the constraint description; they do not imply any ranking

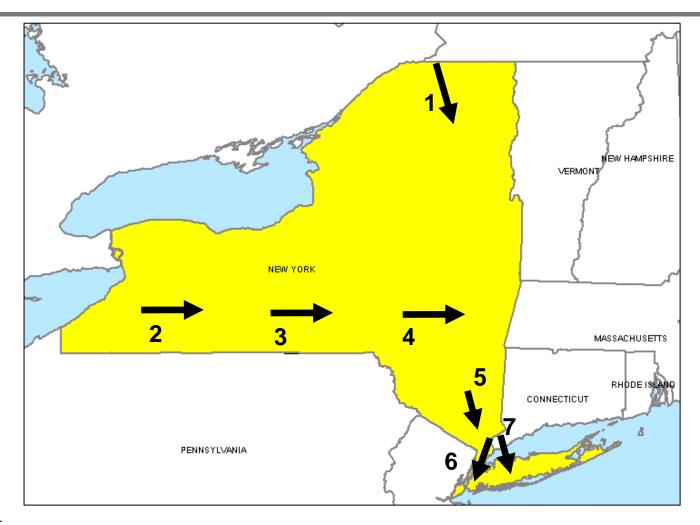


#### **NYISO**

- 1. Moses South Interface (Massena to Marcy, Moses to Adirondack)
- 2. Dysinger East Interface (AES Somerset to Rochester, Niagara to Rochester, Stolle to Meyer)
- 3. West Central Interface (Pannell Road to Clay, Stolle to Meyer)
- **4. Central East and Total East Interface** (Edic to New Scotland, Porter to Rotterdam, Marcy to New Scotland)
- **5. UPNY-Coned Interface** (Ladentown to Buchanan South, Pleasant Valley to Wood St., Pleasant Valley to E. Fishkill, Pleasant Valley to Millwood, Roseton to E. Fishkill, Ramapo to Buchanan North)
- **6. Westchester to NYC** (Sprainbrook W. 49<sup>th</sup> St. 345 kV, Rainey to Dunwoodie 345 kV, Rainey to Vernon 345 kV)
- 7. Westchester to LI (Dunwoodie to Shore Road, Sprain Brook to East Garden City)



## **NYISO**



- Arrows point towards direction of constrained load
- Numbers serve as reference to the constraint description; they do not imply any ranking

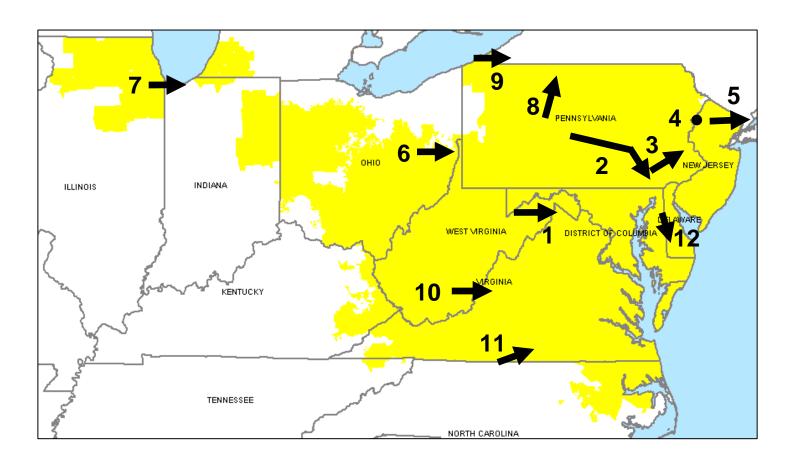


#### **PJM**

- 1. Constraints from APS to PEPCO and Dominion (formerly now as the VEM constraints), primarily Bedington-Black Oak and APS South
- 2. The Western Interface and Central Interfaces of "classic PJM" (Keystone-Juniata, Conemaugh-Juniata, Conemaugh-Huntertown, Doubs-Brighton, and Conastone-Peach Bottom lines).
- **The Eastern Interface of "classic PJM"** (Wescosville-Alburtis, Juniata-Alburtis, TMI-Hosensack, Peach Bottom-Limerick, and Peach Bottom-Keeney 5014 lines).
- 4. The Branchburg transformer
- 5. Constraints from PJM to NYC
- 6. AEP and First Energy to APS (the Wylie Ridge and Kammer transformers)
- 7. The lines connecting ComEd to AEP along Lake Michigan (Crete-St. Johns Tap, Dunes Acres Michigan City, State Line Wolf Lake)
  - These lines also limit MISO flows
  - When AEP joined PJM on October 1, 2004 the NIPS system experienced a significant rise in congestion that was mitigated by including some NIPS constraints in the PJM dispatch
- 8. Homer City345/230 KV Transformer #2
- 9. Erie East Erie SE 230 kV
- 10. Kanawha Mt. Funk
- 11. North Carolina to Southern Virginia
- 12. Constraints into Delmarva Peninsula



## **PJM**



- Arrows point towards direction of constrained load
- Black node represents a constraint affecting all loads in the general vicinity
  Numbers serve as reference to the constraint description; they do not imply any ranking

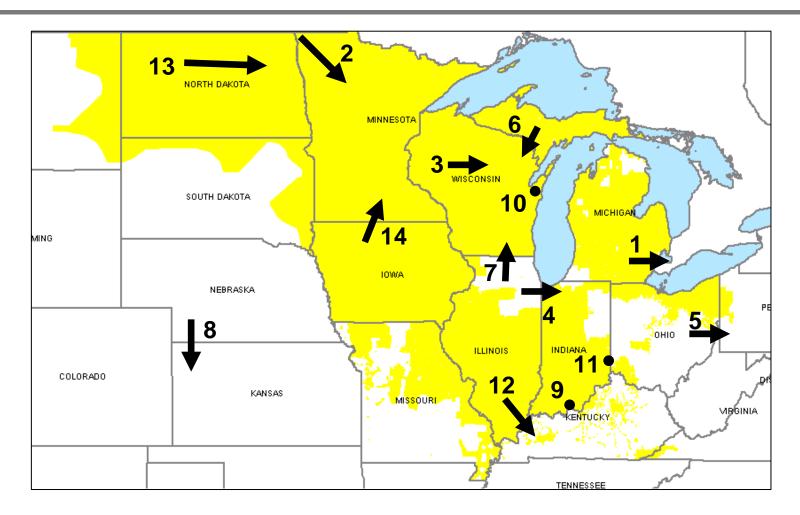


#### **MISO**

- 1. Constraints from Michigan to Ontario (Belle River St. Clair 345 kV)
- 2. Constraints from Manitoba to Minnesota and N. Dakota
- 3. Constraints from Minnesota to Wisconsin (Eau Claire-Arpin, Minnesota-Wisconsin Stability Interface)
  - 1. Limits current flows
  - 2. Limits wind and coal project development in the upper Midwest
- 4. Constraints on the NIPS system that are impacted by ComEd to AEP flows (Dune Acres-Michigan City)
- 5. First Energy to APS (the Wylie Ridge and Kammer transformers)
- 6. Upper Peninsula of MI to Wisconsin (Flow South)
- 7. Constraints limiting flows into Wisconsin from Illinois and Iowa (Paddock transformer)
- 8. Limits W. Nebraska to W. Kansas (Gentleman Red Willow)
- **9. Limits in the LGE system** (Blue Lick 345/161 Xfm, Frankfort East-Tyrone 138)
- **10.** Constraints within WI (Stiles-Amberg 138, Stiles-Amberg 138 + Stiles-Crivitz 138, Kewaunee 345/138 Xfm, Highway V-Preble 138)
- 11. Miami Fort 345-138 kV
- 12. Kentucky to Illinois
- **13.** Western North Dakota to Eastern North Dakota (low cost coal and wind development cited in MISO MTEP 05)
- **14. lowa and Southern Minnesota** (low cost coal and wind development cited in lowa Southern Minnesota Exploratory Study, June 22, 2005).



## **MISO**



- Arrows point towards direction of constrained load
- Black node represents a constraint affecting all loads in the general vicinity
  Numbers serve as reference to the constraint description; they do not imply any ranking



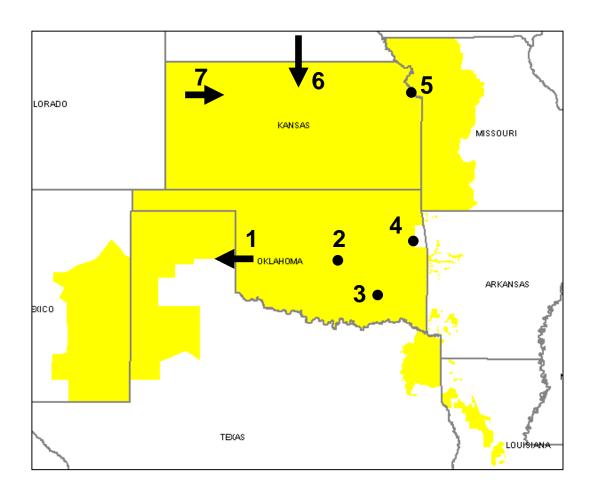
#### SPP

# The following constraints were provided by SPP as having the most firm refused requests for the first 3 quarters of 2005:

- 1. Elk City 230/138 kV Transformer
- 2. Redbud-Arcadia 345 kV
- 3. Valliant-Lydia 345 kV and Pittsburg-Seminole 345 kV
- Ft. Smith 500/345 kV Transformer
- 5. latan-Stranger Creek 345 kV
- Nebraska to Kansas (cited in SPP's "Summary of Congestion in SPP and Potential Economic Expansion Alternatives," February 2006)
- 7. Kansas panhandle wind development (cited in SPP's "Summary of Congestion in SPP and Potential Economic Expansion Alternatives," February 2006)



## **SPP**



- Arrows point towards direction of constrained load
- Black node represents a constraint affecting all loads in the general vicinity
  Numbers serve as reference to the constraint description; they do not imply any ranking



## **Entergy:**

- 1. Southeast Missouri to Northeast Arkansas
- 2. Central Arkansas to Southern Arkansas
- 3. Ft. Smith 500 kV
- 4. Southeast Louisiana to Western Louisiana
- 5. Flow into New Orleans
- 6. McAdams 500/230 kV Autotransformer



#### TVA:

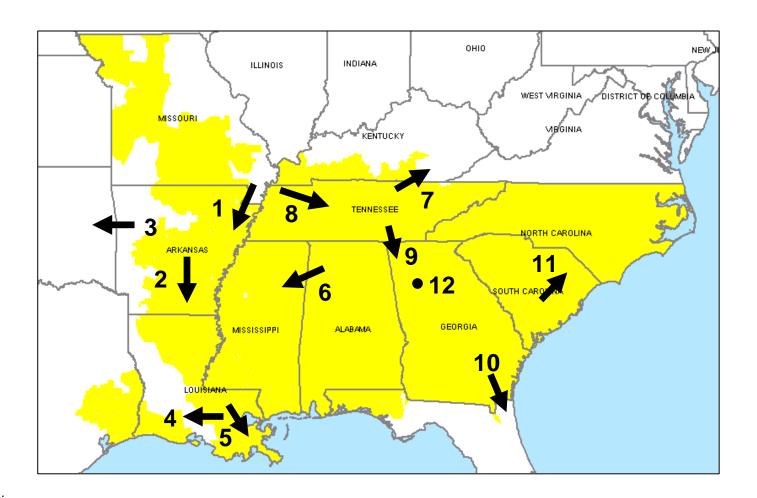
- 7. Volunteer 500 kV Transformer Bank and Sullivan 500 kV Transformer Bank (upgrades have alleviated this historical constraint).
- 8. Cumberland-Davidson 500 kV Line and the Johnsonville-Davidson 500 kV lines
- 9. Tennessee to Georgia



#### Southern

- 10. Southern FRCC Interface
- 11. Eastern South Carolina
- 12. Atlanta





- Arrows point towards direction of constrained load
- Black node represents a constraint affecting all loads in the general vicinity
  Numbers serve as reference to the constraint description; they do not imply any ranking







March 15, 2006

# **Documents and Data**



#### **Documents/Data**

#### Regional transmission expansion plans

- ISO-NE Regional System Plan 2005 (October 2005)
- MISO 2003 Transmission Expansion Plan
- MISO Transmission Expansion Plan 2005 (June 2005)
- NYISO Comprehensive Transmission Plan
- System Reliability Assurance Study, ConEd (December 2005)
- PJM Regional Transmission Expansion Plan 2005 (September 2005)
- SPP RTO Expansion Plan 2005-2010 (September 2005)



#### Other regional reports

- SERC Reliability Review Subcommittee's 2005 Report to the SERC Engineering Committee (June 2005)
- VACAR 2004-2005 Winter Stability Study Report (Mar 2004)
- VACAR 2005 Summer Reliability Study Report (Apr 2004)
- VACAR 2007 Summer Reliability Study Report (Feb 2002)
- NYISO 2005 Load & Capacity Data
- NYISO Operating Study Winter 2004-05 (November 2004)
- NYISO Transmission Performance Report (August 2005)
- NYISO 2004 Intermediate Area Transmission Review of the New York State
- Project Mountaineer, Work Group Meeting, Sheraton Four Points Hotel Baltimore, MD, August 3, 2005



#### NERC reports

- NERC 2005 Long-Term Reliability Assessment
- NERC 2005 Summer Assessment
- NERC 2005/2006 Winter Assessment

#### Inter-Regional reports

- Florida-Southern Interface Study for 2005 Summer & 2005-06 Winter Bulk Electric Supply Conditions (Oct 2004)
- MEN 2002 Interregional Transmission System Reliability Assessment
- VASTE 2005 Summer Reliability Study Report (May 2005)
- VASTE 2005-06 Winter Study Report (Nov 2005)
- VEM 2004 Summer Reliability Study Report (May 2004)
- VEM 2004-2005 Winter Reliability Study Report (Nov 2004)
- VST(E) 2011 Summer Study Report (Nov 2004)
- VSTE 2008 Summer Study Report (Nov 2005)
- NPCC 2004 Report of the CP-10 Working Group Under the Task Force on Coordinated Planning



#### Other documents

- Cambridge Energy Research Associates, Inc. (CERA), "Grounded in Reality: Eastern Interconnection"
- Cambridge Energy Research Associates, Inc. (CERA), "Congestion Problems Identified"
- U.S. Department of Energy, "National Transmission Grid Study," May 2002
- Electricity Advisory Board, Electric Resources Capitalization Subcommittee, U.S. Department of Energy, "Competitive Wholesale Electricity Generation: A Report of the Benefits, Regulatory Uncertainty, and Remedies to Encourage Full Realization Across All Markets," September 2002
- Electricity Advisory Board, U.S. Department of Energy, "Transmission Grid Solutions Report," September 2002
- PJM Interconnection, L.L.C., "Comments of PJM in Response to the MD PSC Notice of Inquiry" – Case Number 9047
- Electric Transmission Constraint Study, FERC OMTR, December 2001



#### Other documents (continued)

- Maryland Public Service Commission, "Reply Comments of the Staff of the Maryland Public Service Commission in the Matter of the Inquiry Into Locational Marginal Prices in Central Maryland During the Summer of 2005" – Case No. 9047
- Federal Energy Regulatory Commission, "Testimony of Karl Pfirrmann, President, PJM Western Region, PJM Interconnection, L.L.C.," Promoting Regional Transmission Planning and Expansion to Facilitate Fuel Diversity Including Expanded Uses of Coal-Fired Resources – Docket No. AD05-3-000
- Federal Energy Regulatory Commission, "Remarks of Audrey Zibelman, Executive Vice President, PJM Western Region, PJM Interconnection, L.L.C.," Transmission Independence and Investment – Docket No. AD05-5-000 and Pricing Policy for Efficient Operation and Expansion of the Transmission Grid – Docket No. PL03-1-000
- U.S. Department of Energy, "Comments to the Designation of National Interest Electric Transmission Bottlenecks (NIETB) Notice of Inquiry," Appended 10/15/04
- Michigan Public Service Commission, "Final Staff Report of the Capacity Need Forum," January 3, 2006



#### • Data

- NERC TLR
- ISONE congestion
- NYISO congestion
- PJM congestion
- MISO congestion



# Congestion Measurement and Transmission Expansion Methodologies



#### Types of Analyses

#### Reliability Assessment

- Identify elements that limit flows under a range of load and generation conditions
- Identify constraints that would limit flows between and within regions as interregional transfers increases
- Determine whether load can be served reliably (e.g., LOLE, LOLP)

## Economic Analysis

Quantify the location, duration and cost of congestion



## **Types of Analyses - Methodology**

#### Reliability assessment

- Uses load flow modeling with snapshots of load and generation conditions to locate limiting elements that need re-enforcement
- Often uses operating data
- Backward and forward looking

## Economic Analysis

- Based on actual operating experience or on modeled projections
- Generally forward looking



#### Regional Analytic Approaches

- FRCC's approach: "There are currently no activities at this time" <a href="http://www.frcc.org/PublicNotice.htm">http://www.frcc.org/PublicNotice.htm</a>
  - No TLRs in 2005
  - One TLR in 2004 related to hurricane Frances
  - No other transmission related data available
  - Florida-Georgia border congestion managed by contractual flow limits
- SERC's uses reliability standards
- ISONE uses reliability standards
- NYISO uses reliability standards, including LOLE calculated by the GE Multi-Area Reliability Simulation ("MARS")
- SPP's approach is both reliability and economics
  - Economic analysis is used to measure cost-benefit ratios to screen system upgrades



#### Regional Analytic Approaches - PJM

#### The PJM process is:

- Identify needs based on congestion
- Determine the extent to which congestion can be hedged
- If there is significant "unhedgeable" congestion, PJM opens a oneyear "market window" in which it seeks congestion relief projects from the market
- If no adequate, cost-effective proposal is made, PJM determines projects to be implemented through the RTEPP based on a costbenefit analysis
- PJM reports that 54 facilities have experienced sufficient levels of unhedgeable congestion to warrant a market window



## Regional Analytic Approaches – PJM (continued)

- The PJM process uses congestion as the fundamental measure of need and recognizes that congestion is not a problem if it can be hedged via market mechanisms (FTRs) I
- The PJM process also implicitly recognizes that investment to relieve congestion is not necessarily going to have a "pure" market solution
  - FTRs created by a new transmission project typically won't compensate an investor since their value may be small or zero
- If an appropriate project is proposed during a market window, the successful bidder is paid for the project (not given FTRs)



#### TVA's Transmission Load at Risk Metric

- TVA uses a measure called Transmission Load at Risk ("TLAR") to make an economic determination of transmission upgrade needs:
  - TVA estimates the amount of load (MWh) that would have to be shed to maintain acceptable flows on the transmission system.
     This is the TLAR
  - TVA calculates the margin associated with those sales in terms of \$/MWh
  - The product of TLAR and margin is a measure of the value of a transmission upgrade



## TVA's Transmission Load at Risk Metric (continued)

- TVA uses TLAR as a tool to prioritize problems
- TLAR could be used to estimate the cost and benefit of an upgrade:
  - For each hour of a year, calculate TLAR, and Margin,
  - Sum the products of TLAR and margins over the year:

Annual benefit of upgrade =  $\Sigma TLAR_t^*$  Margin<sub>t</sub>

 Compare annual benefit to the annualized cost of a transmission project designed to eliminate the problem



# Flowgates and TLRs



## Transmission Loading Relief (TLR) Procedure

- ➤ Mitigating transmission constraints: A Reliability Coordinator may utilize the TLR Procedure to mitigate potential or actual System Operating Limit (SOL) violations or Interconnection Reliability Operating Limit (IROL) violations on any transmission facility modeled in the Interchange Distribution Calculator (IDC).
- Order of TLR Levels and taking emergency action: The Reliability Coordinator is not required to follow the TLR Levels in their numerical order. Furthermore, if a Reliability Coordinator deems that a transmission loading condition could jeopardize Bulk Electric System reliability, the Reliability Coordinator shall have the authority to enter TLR Level 6 directly, and immediately direct the Balancing Authorities or Transmission Operators to take such actions as redispatching generation, or reconfiguring transmission, or reducing load to mitigate the critical condition until Interchange Transactions can be reduced utilizing the TLR Procedure or other methods to return the system to a secure state.

#### > TLR Notification:

- The Reliability Coordinator initiating the TLR Procedure shall inform all other Reliability Coordinators via the Reliability Coordinator Information System (RCIS) that the TLR Procedure has been implemented.
- The Reliability Coordinator shall notify Transmission Operators and Balancing Authorities in its Reliability Area when entering and leaving any TLR level.
- ➤ **Updates:** At least once each hour, or when conditions change, the Reliability Coordinator implementing the TLR Procedure shall update all other Reliability Coordinators (via the RCIS). Transmission Operators and Balancing Authorities who have had Interchange Transactions impacted by the TLR will be updated by their Reliability Coordinator.
- ➤ **Obligations:** All Reliability Coordinators shall comply with the request of the Reliability Coordinator who initiated the TLR Procedure, unless the initiating Reliability Coordinator agrees otherwise.



## **TLR Level Criteria**

	TLR Levels				
TLR Level	Reliability Coordinator Action	Comments			
1	Notify Reliability Coordinators of potential Operating Security Limit violations				
2	Hold Interchange Transactions at current levels to prevent Operating Security Limit violations	Of those transactions at or above the Curtailment Threshold, only those under existing Transmission Service reservations will be allowed to continue, and only to the level existing at the time of the hold. Transactions using Firm Point-to-Point Transmission Service are not held. See Appendix 9C1, Section B.1.			
3a	Reallocation Transactions using Non-firm Point-to- Point Transmission Service are curtailed to allow Transactions using higher priority Point-to-Point Transmission Service	Curtailment follows Transmission Service priorities. Higher priority transactions are enabled to start by the Reallocation process. See Appendix 9C1, Section B.3.			
3b	Curtail Transactions using Non-firm Point-to-Point Transmission Service to mitigate Operating Security Limit Violation	Curtailment follows Transmission Service priorities. There are special considerations for handling Transactions using Firm Point-to-Point Transmission Service. See Appendix 9C1, Section B.4.			
4	Reconfigure transmission system to allow Transactions using Firm Point-to-Point Transmission Service to continue	There may or may not be an Operating Security Limit violation. There are special considerations for handling Transactions using Firm Point-to-Point Transmission Service. See Appendix 9C1, Section B.5.			
5a	Reallocation Transactions using Firm Point-to- Point Transmission Service are curtailed (pro rata) to allow new Transactions using Firm Point-to- Point Transmission Service to begin (pro rata).	Attempts to accommodate all Transactions using Firm Point-to-Point Transmission Service, though at a reduced ("pro rata") level. Pro forma tariff also requires curtailment / Reallocation on pro rata basis with Network Integration Transmission Service and Native Load. See Appendix 9C1, Section B.6.			
5b	Curtail Transactions using Firm Point-to-Point Transmission Service to mitigate Operating Security Limit Violation	Pro forma tariff requires curtailment on pro rata basis with Network Integration Transmission Service and Native Load. See Appendix 9C1, Section B.7.			
6	Emergency Action	Could include demand-side management, re-dispatch, voltage reductions, interruptible and firm load shedding. See Appendix 9C1, Section B.8.			
0	TLR Concluded	Restore transactions. See Appendix 9C1, Section B.9.			



# Flowgates by Location

Security Coordinator	Flowgates	% of Total
MISO	698	48.0%
MISO, PJM	158	10.9%
РЈМ	97	6.7%
EES	88	6.1%
SWPP	68	4.7%
TVA	48	3.3%
VACS	37	2.5%
MISO,TVA	24	1.7%
TVA, MISO	24	1.7%
Other < 24	212	14.6%
Total	1,454	100.0%



## MISO TLR Calls - 2004 to 2005

#### TLRs >= Level 3

Flowgate - Official	2004	2005	Grand Total
Flow South	2,917	832	3,749
EAU CLAIRE-ARPIN 345 KV	142	1,589	1,731
Dune Acres-Michigan City 138 1&2 (flo) Wilton Center-Dumont 765	1,369	173	1,542
Blue Lick-Bullitt Co 161 (flo) Baker-Broadford 765	153	1,135	1,288
N.PLATTE-STVL /GENTL-REDWIL	670	138	807
GENTLMN3 345 REDWILO3 345 1	58	707	765
MWSI	33	671	704
Highway V - Preble 138 (flo) Lost Dauphin - Red Maple 138	612	1	613
Crete-St Johns Tap 345 kV I/o Dumont-Wilton Center 765 kV line	389	127	516
MHEX_S	213	282	495
Smith- Green River Steel 138 (flo) Smith - Hardin Co 345	6	429	435
Lakefield-Fox lake 161 (flo) Lakefield-Wilmarth 345	428	5	434
Miami Fort 345/138 Xfm flo East Bend-Terminal 345	208	223	431
Smith-Hardin County 345 (flo) Hardinsburg-Harding Co. 138	145	252	397
Blue Lick 345/161 XFMR-Baker-Broadford 765	279	114	394
MHEX_N	381	3	384
St Francis - Lutesville 345 (flo) Bland - Franks 345	238	133	372
Frankfort East-Tyrone 138 (flo) Ghent-West Lexington 345	250	112	362
Arnold-Vinton 161 for D.Arnold-Hazleton 345	186	155	341
COOPER_S	20	297	317



## EES TLRs - 2004 to 2005

Flowgate - Official	2,004	2,005	Grand Total
McAdams500-230 for loss of McAdams-Lakeover	134	1,235	1,369
Richard-Colonial Academy 138kV for loss of Richard-Scott 138kV	708	92	800



## **SWPP TLRs – 2004 to 2005**

Flowgate - Official	2004	2005	Grand Total
SphWmcSumEmc	553	349	902
HppValPitVal	464	295	759



# **Top 10 SPP TLRs by Total MWs Curtailed**

Constraint/Flowgate Monitored Element	Total MWs Curtailed (2005)	Firm MWs Curtailed (2005)	Firm Refused Requests (1st 3Q 2005)	Non-Firm Refused Requests (1st 3Q 2005)
latan-Stranger Creek 345 kV	32526	390		6.1%
Creswell-Kildare 138 kV	27793	315	32.6%	10.9%
Hugo Power Plant-Valliant 138 kV	22979	1106	24.2%	3.1%
Lang-Wichita 345 kV	12570	100		0.7%
Northeast Station-Delaware 345 kV	12036	221		
LaCygne-Neosho 345 kV	11258	0		
SPS North-South Stability Limit	11237	485		
S. Philips Junction-W. McPherson 115 kV	10611	526	1.8%	4.9%
Redbud-Arcadia 345 kV	9145	57	8.2%	19.0%
LaCygne-West Gardner 345 kV	8059	659	1.8%	1.5%

Source: SPP



## TVA TLRs - 2004 to 2005

Flowgate - Official	2004	2005	Grand Total
Cumbland-Davidson&Cumbland-Jvill	1,138	561	1,700
Bull Run - Volunteer 500kV	0	441	441



# **ISONE**



#### **ISONE 2005 Regional System Plan**

- Table 4.4 has interface limits that in some cases vary by year
- ➤ Chapter 8 (page 86) has a list of major projects, some of which, if they are not there, probably should be included in our dataset:
  - Northeast Reliability Interconnect Project
    - > Ties NB to New England
    - > 345 kV
    - ➤ In service planned end of 2007
  - Northwest Vermont
    - Construction supposed to have stared by now
    - > But seems like it's still fairly speculative
  - > NSTAR 345 kV
    - Under construction
    - ➤ In-service late 2007
  - Southwest Connecticut Reliability Project
    - > Phase I completion late 2006
    - > Phase II is too speculative to model
- Appendix C has description of locations across New England and problems they experience
  - > Most of the description is not very informative for modeling purposes
- > The two slides that follow show under-constructing projects



# Regional System Plan – Project List

Primary Equipment Owner	Projected In- Service Month/Year	Major Project	Project	July 05 Status
National Grid, USA	Dec-05	Central Massachusetts Reinforcements	Reconductor W-175 115 kV from Carpenter Hill to W. Charlton	Under Construction
National Grid, USA	Dec-05	Replace 69 kV circuit breakers at Fitch Rd. S/S in Clinton, MA.		Under Construction
Northeast Utilities-CT	Dec-05		Shaw's Hill Substation - add new 115/13.8 kV transformer and 115 kV tie breaker.	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (1) new 345 kV UG Cables from Stoughton to Mattapan Sq.to K Street and install new autotransformer at K. St.	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (1) 345/115 kV autotransformer at Hyde Park Substation	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (1) new 345 kV UG Cable from Stoughton to Mattapan Sq. to Hyde Park Substation	Under Construction



# Regional System Plan – Project List

NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project  Add (1) 345 kV breaker at Hyde Park Substation		Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (2) 115 kV circuit breakers at Hyde Park Substation	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (3) 345 kV circuit breakers at K St.	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add (2) Heat Exchangers on Baker- Hyde Park 115 kV circuits.	Under Construction
NSTAR	Jun-06	NSTAR 345 kV Transmission Reliability Project	Add 345 kV Stoughton switching station in ring bus configuration along with circuit breakers.	Under Construction
NSTAR	Dec-07	NSTAR 345 kV Transmission Reliability Project	Add 2nd 345 kV UG Cables from Stoughton to Mattapan Sq.to K Street and install another new autotransformer at K. St.	Under Construction



# **DA – Binding Constraints 2004-2005**

Constraint Name	Contingency Name	Total Hours	CONT/ LINE	CONTINGENCY (DESCRIPTION)/ LINE (STATION A)	STATION B
NRST	Interface	2,947	#N/A	#N/A	#N/A
NS_ST	Interface	1,660	#N/A	#N/A	#N/A
Node_Highgate_Export	Generic Constraint	1,584	#N/A	#N/A	#N/A
BSTN	Interface	1,466	#N/A	#N/A	#N/A
SCOBIE 326-1 A LN	394	1,157	Contingency	LINE 394-1-2/	0
WALTHAM_282-520-2_A_LN	Actual	938	#N/A	#N/A	#N/A



# **RT - Binding Constraints 2004-2005**

Constraint Name	Contingency Name	Total Hours	CONT/ LINE	CONTINGENCY (DESCRIPTION)/ LINE (STATION A)	STATION B
BASE_INTRFC_ORR-SO	BASE	1,935	#N/A	#N/A	#N/A
BASE_INTRFC_NRST	BASE	1,154	#N/A	#N/A	#N/A



# **NYISO**



# Regional System Plan – Project List

#### Redacted



# Regional System Plan – Project List

#### Redacted



# **DA – Binding Constraints 2004-2005**

Constraint Name	Total hours
DUNWODIE 345 SHORE_RD 345 1	11,428
FRESHKLS 138 WILLWBRK 138 1	6,227
VALLYSTR 138 EGRDNCTY 138 1	5,449
RAINEY 138 VERNON 138 1	4,427
W49TH_ST 345 SPRNBRK 345 1	2,887
RAINEY 138 VERNON 138 1	2,589
NEWBRDGE 138 FREEPORT 138 1	2,471
HUDS_AVE 138 JAMAICA_ 138 2	2,459
HUDS_AVE 138 JAMAICA 138 1	2,378
RAINEY 345 DUNWOD71 345 1	2,142
ASTORIAE 138 HELLGT_E 138 1	1,868
ELWOOD_W 138 GREENLWN 138 1	1,738
E179TH_W 138 HELLTP_W 138 1	1,428
E179THST 138 HELLGT_E 138 1	1,411
CENTRAL EAST - VC	1,389
BARRETT_ 138 VALLYSTR 138 2	1,197
NRTHPORT 138 PILGRIM 138 3	902
E13THSTA 345 W49TH_ST 345 1	880



# **RT - Binding Constraints 2004-2005**

Constraint Name	Hours
VERNON/GREENWOOD	14,940
GREENWOOD/STATEN ISLAND	12,647
CONED CABLE INTERFACE	9,424
AST EAST/CORONA/JAMAICA	9,422
DUN-SHORE RD Y50	9,412
DUNWO-SHORR345 Y50	9,412
CONED IN CITY 345/138	9,268
ASTORIA WEST/QUEENSBRIDG	9,165
DUNWODIE 345 SHORE_RD 345 1	7,272
VALST-E.G.C138 262	6,643
AST E/CORONA/JAMAICA	6,129
CENT EAS L/O N.SCOT99BUS	5,808
DYSINGER EAST	5,337
SHORR-LAKSU138 367	5,261
VLY ST-EGARD262	5,181
SPRBR-E.G.C345 Y49	5,081
AST WEST/QUEENSBR/VERNON	5,045
SHORR-LAKSU138 368	4,757
SPR/DUN-SOUTH	4,476
IN-CITY 345/138 KV	4,230
AST W/QUEENSBRDG	4,208

Constraint Name	Hours
EAST RIVER	3,971
WEST-CENTRAL TIES	3,910
E.GARD-NEWBR 463	3,809
E.G.C-NEWBR138 463	3,781
SPRAINBROOK-E.GARD C Y49	3,679
CENTRAL EAST TIES	3,658
CENT-EAST L/O MARCY TWR	3,156
CENTRAL EAST - VC	2,972
LEEDS-PLTVL345 92	2,809
STOLLE-MEYER 67	2,543
ELWOOD_W 138 GREENLWN 138 1	2,382
ATHEN-PLTVL345 91	2,364
NRTHPORT 138 PILGRIM 138 2	2,194
STOLL-MEYER230 67	2,186
GREENLWN 138 SYOSSET 138 1	2,156
UPNY-CONED TIES	2,014
STATEN ISLAND	1,884
NIAG3-ROCH3345 NR2	1,856
AST W/QUEENSBRG/VERNON	1,853
E.G.C-NEWBR138 462	1,820
ROCH3-PANN2345 RP-1	1,767

Constraint Name	Hours
ROCH3-PANNE345 RP-2	1,757
PLSNTVLY 345 LEEDS 345 1	1,707
SHORR 345/138 BK;1	1,679
NRTHPORT 138 PILGRIM 138 1	1,464
PANN2-CLAY 345 PC-1	1,449
E.G.C-CARLP138 361	1,322
SCRIB-VOLNE345 20	1,301
GRNLN-SYOSS138 676	1,284
GRNLN-ELWO1138 673	1,262
ELWOOD_W 138 NRTHPORT 138 1	1,260
GLENS-CARLP138 363	1,223
MARCY 765/345 MAR-AT1	1,203
OAKWO-SYOSS138 675	1,167
BUCHN-EVW2N345 W93	1,091
E.GARD-NEWBR 462	1,066
E.G.C-ROSLY138 362	1,046
PLGM2-HAUPG138 871	1,043
SCRIBA 345 VOLNEY 345 1	1,038
ROSTN-FISHK345 RFK-305	989
ELWOOD_E 138 NRTHPORT 138 1	911



# **PJM**



Projected In-Service Month/Year	Project	July 05 Status
Jun-07	Installation of 176 MVAR caps at various sub stations Install reactive sources in	Under Construction
Jun-05	Upgrade Midd Jct - Zions View 115 kV	Under Construction
Dec-05		Under Construction
	Add 180 MVAR of distributed capacitors in JCP&L. 65 MVAR are being added in northern JCP&L and 115 MVAR are being added to southern	
Jun-06		Under Construction
	Build new Red Lion – Milford – Indian River 230 kV circuit	
May-06		Under Construction
	Indian River Sub - 230kV Terminal Position	



Projected In-Service Month/Year	Project	July 05 Status
Dec-05		Under Construction
	Red Lion Sub - 230kV Terminal Position	
Apr-06		Under Construction
	Sayreville 230kV	
Sep-05		Under Construction
	Upgrade Deans 230 kV breaker #1-5	
Oct-05		Under Construction
	Upgrade Deans 230 kV breaker #1-7	
Nov-05		Under Construction
	Upgrade Deans 230 kV breaker #1-9	



# **DA – Binding Constraints 2004-2005**

MONITORED FACILITY	CONTINGENCY FACILITY	DAY AHEAD CONTINGENCY EVENT	2004	2005	Grand Total
BED-BLA	Pruntytown-Mt. Storm (510) 500 kV line	BED-BLA L/O Pruntytown-Mt. Storm (510) 500 kV line	3,448	4,457	7.905
CEDARGRO230 KV CED-CLIK	Roseland-Cedar Grove- Clifton-Athenia (B-2228) 230	CEDARGRO230 KV CED-CLIK L/O Roseland-Cedar Grove-Clifton-Athenia (B- 2228) 230	606	2,907	3,513
Cedar Interface	ACTUAL	Cedar Interface	1,252	1,615	2,867
EAST	ACTUAL	Eastern Interface	1,385	1,301	2,686
HOMERCIT345 KV HOM-WAT	ACTUAL	HOMERCIT345 KV HOM-WAT	690	1,898	2,588
KAMMER2 765 KV .200	Belmont-Harrison 500 kV line (AP)	KAMMER2 765 KV .200 L/O Belmont- Harrison 500 kV line (AP)		2,065	2,065
Crete - St Johns Tap 345 kV	DUMONT WILTON CENTER 765KV LINE	Crete - St Johns Tap 345 kV L/O DUMONT WILTON CENTER 765KV LINE	1,191	817	2,008
CENTRAL	ACTUAL	Central Interface	674	1,332	2,006
BEDINGTO138 KV BED-NIP	BEDINGTON DOUBS LINE	BEDINGTO138 KV BED-NIP L/O BEDINGTON DOUBS LINE	142	1,494	1,636
TIDD_AEP138 KV MAH-TID	WEIRTON-CARNEGIE-TIDD (224) 138 KV (APS)	TIDD_AEP138 KV MAH-TID L/O WEIRTON- CARNEGIE-TIDD (224) 138 KV (APS)	601	1,034	1,635
BERGEN 230 KV BER-HOB	Hudson-Penhorn-Bellville-N. Bergen-Bergen (X-2250)	BERGEN 230 KV BER-HOB L/O Hudson- Penhorn-Bellville-N. Bergen-Bergen (X- 2250)	1,051	514	1,565



## **DA – Binding Constraints 2004-2005 (continued)**

MONITORED FACILITY	CONTINGENCY FACILITY	DAY AHEAD CONTINGENCY EVENT	2004	2005	Grand Total
LAUREL 69 KV LAU- WOO	CUMBERLAND AE- CHURCHTOWN 230 LINE	LAUREL 69 KV LAU-WOO L/O CUMBERLAND AE-CHURCHTOWN 230 LINE	724	780	1,504
KAMMER2 765 KV .200	Belmont-Harrison 500 kV line (AP)	KAMMER2 765 KV .200 L/O Belmont- Harrison 500 kV line (AP)	199	1,116	1,315
50045005 4	Hunterstown-Conastone (5013) & Hunterstown #1 xfmr	50045005 4 L/O Hunterstown-Conastone (5013) & Hunterstown #1 xfmr		1,299	1,299
BERGEN 230 KV BER- LEO	ACTUAL	BERGEN 230 KV BER-LEO	365	875	1,240
BRANCHBU500 KV 500-5	BRANCHBURG-DEANS & DEANS 500-1 & SOMERVILLE RELAY	BRANCHBU500 KV 500-1 L/O BRANCHBURG-DEANS & DEANS 500-1 & SOMERVILLE RELAY	1,093	117	1,210
SHIELDAL69 KV SHI- VIN	CUMBERLAND AE- CHURCHTOWN 230 LINE	SHIELDAL69 KV SHI-VIN L/O CUMBERLAND AE-CHURCHTOWN 230 LINE	1,038	137	1,175
SHIELDAL69 KV SHI- VIN	CHAMBERS-CHURCHTOWN	SHIELDAL69 KV SHI-VIN L/O CHAMBERS-CHURCHTOWN	953	203	1,156
BRANCHBU500 KV 500-4	BRANCHBURG-DEANS & DEANS 500-1	BRANCHBU500 KV 500-1 L/O BRANCHBURG-DEANS & DEANS 500-1	736	158	894



# **RT - Binding Constraints 2004-2005**

MONITORED FACILITY	CONTINGENCY FACILITY	2004	2005	Grand Total
BED-BLA	LINE 500 KV MTSTORM-PRUNTYTO	1,361	1,700	3,061
KAMMER2 765 KV KAMMER2 .200 XFORMER	LINE 500 KV BELMONT-HARR APS	121	1,613	1,734
LINE 69 KV LAUREL-WOODSTOW 0740	LINE 230 KV CHURCHTO-CUMB AE 2314	450	938	1,388
LINE 500 KV MTSTORM-PRUNTYTO	LINE 500 KV BEDINGTO-BLACKOAK 500KV	1	972	973
WYLIERID500 KV WYLIERID TRAN 5 XFORMER	WYLIERID500 KV WYLIERID TRAN 7 XFORMER	827	120	947
CEDAR	Actual	426	463	889



#### TLR Calls - 2004 to 2005

#### TLRs >= Level 3

RelCo or	Control Areas	FGID	Flowgate - Official	2004	2005	Grand Total
РЈМ	РЈМ	2358	Wylie Ridge #5 345/500 xfmr I/o Wylie Ridge #7 345/500 xfmr	3,422	116	3,537
РЈМ	РЈМ	100	Kammer #200 765/500 kV xfmr I/o Belmont-Harrison 500	191	1,190	1,381
РЈМ	РЈМ	23	Roseland-Cedar Grove F 230 kV I/o Roseland-Cedar Grove B	311	615	926

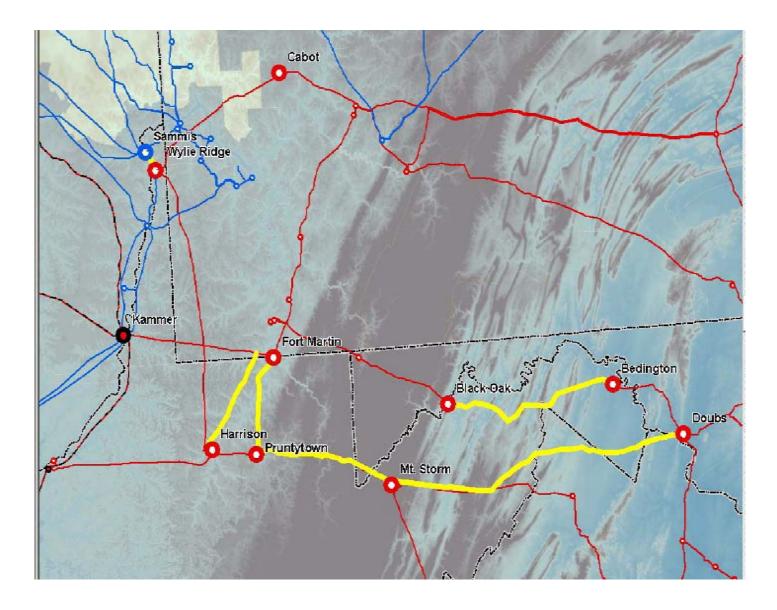


#### **Project Mountaineer**

- Project Mountaineer is an effort by PJM to identify new transmission facilities needed to move power from west to east across PJM
- The focus is the area often referred to as the VEM constraints
- Project Mountaineer Working Group's mandate was to:
  - Identify required transmission faculties
  - Taking into account costs and benefits, and
  - Regulatory, environmental and siting issues
  - Provide feedback to the Regional Planning Process Working Group

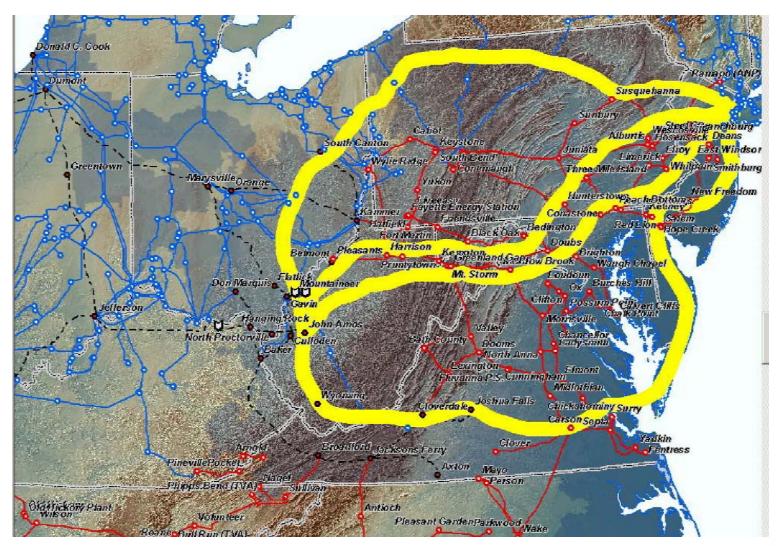


# **Project Mountaineer**





#### **Project Mountaineer – "Major Transmission Corridors"**





# **MISO**



MTEP-05 Expected in Service Date	From:	То:	Current Status
May-06	Plymouth	Elm Creek	Planned
Jun-06	Adair–Thomas Hill	Install 161 kV Breaker at Adair	Planned
Jun-06	Cahokia	Meramec (Reconductor)	Planned
Jun-06	Cahokia	Meramec (Reconductor)	Planned
Jun-06	Campbell	Maline (reconductor)	Planned
Jun-06	Campbell	Maline (reconductor)	Planned
Jun-06	Casey	Breed (reconductor riv. Crossing)	Planned
Jun-06	Conway	Breaker Additions	Planned
Jun-06	Duck Creek	Tazewell (convert bus duct to OH)	Planned
Jun-06	Frederick	Meredosia (Increase ground clearance)	Planned
Jun-06	Havana	lpava (reconductor)	Planned
Jun-06	Kinmundy	Salem (Increase ground clearance)	Planned
Jun-06	Line 1342C tap	Line 1342A (structure 423 to 467A reconductor)	Planned
Jun-06	Marion	CarrierMills	Planned



MTEP-05 Expected in	_	_	Current
Service Date	From:	То:	Status
Jun-06	Newton	Effingham (reconductor)	Planned
Jun-06	Rising (138 kV breaker addition)	Bondville Rt. 10	Planned
Jun-06	Roxford	Mississippi Tap (reconductor)	Planned
Jun-06	Roxford	Mississippi Tap (reconductor)	Planned
Jun-06	Warson	Breaker Additions	Planned
Jun-06	Amberg	Crivitz (rebuild)	Planned
Jun-06	Columbia	North Madison (convert)	Planned
Jun-06	Crivitz	Stiles (rebuild)	Planned
Jun-06	Dewey Tap	Weston	Planned
Jun-06	Gardner Park (new Weston)	Weston	Planned
Jun-06	Gardner Park (new Weston)	Weston	Planned
Jun-06	Gardner Park (was Weston) 345-115		Planned
Jun-06	Gardner Park (was Weston) 345-116		Planned
Jun-06	Martin Road	South Fond du Lac	Planned



MTEP-05 Expected in Service Date	From:	To:	Current Status
Jun-06	North Madison 345-138 (replace)		Planned
Jun-06	North Madison 345-138 (replace)		Planned
Jun-06	Northpoint	Dewey Tap	Planned
Jun-06	NOW	Amberg (rebuild)	Planned
Jun-06	Plains	NOW (rebuild)	Planned
Jun-06	Stiles	Amberg (rebuild)	Planned
Jun-06	Stone Lake 345-161 kV		Planned
Jun-06	Stone Lake 345-161 kV		Planned
Jun-06	Weston	Kelly	Planned
Jun-06	A B Brown (SIGE)	Northwest (SIGE)	Planned
Jun-06	Duff (SIGE)	Dubois (SIGE)	Planned
Jun-06	Airtech	Faribault Energy Center	Planned
Jun-06	Aldrich	St. Louis Park	Planned
Jun-06	Crooked Lake	Enterprise Park	Planned



MTEP-05			
Expected in Service Date	From:	То:	Current Status
Jun-06	Eastwood Tap	Eastwood	Planned
Jun-06	Eastwood Tap	Eastwood	Planned
Jun-06	Faribault Energy Center	Lake Marion	Planned
Jun-06	Fox Lake	Rutland	Planned
Jun-06	l94 Industrial Park tap	Salida Crossing	Planned
Jun-06	Inver Hills	Koch	Planned
Jun-06	Lawrence	Minnehaha	Planned
Jun-06	Minnehaha	Lincoln County	Planned
Jun-06	Oakdale	Tanners Lake	Planned
Jun-06	Prairie Island	Red Rock	Planned
Jun-06	Salida Crossing	Sherco	Planned
Jun-06	Sherco	Monticello	Planned
Jun-06	Sherco 345-115 kV		Planned
Jun-06	St Cloud	l94 Industrial Park tap	Planned



MTEP-05 Expected in	<b>-</b>		Current
Service Date	From:	То:	Status
Jun-06	West Faribault	Airtech	Planned
Jun-06	Wilmarth	Eastwood	Planned
Nov-06	Herblet Lake	Sherridon	Planned
Dec-06	Callaway	Franks	Planned
Dec-06	Redwood Falls Tap	Franklin	Planned
Dec-06	Baxter	Southdale	Planned
Mar-07	Herblet Lake	Chisel Lake	Planned
Mar-07	Herblet Lake Transformer		Planned
Jun-07	Cahokia	W. Salem	Planned
Jun-07	Crab Orchard	N. Coulterville	Planned
Jun-07	Jefferson City 345 / 161	Marion South (reconductor)	Planned
Jun-07	Joachim 345 / 138	Jefferson City	Planned
Jun-07	Loose Creek	Sioux (breaker addition at Mason)	Planned
Jun-07	Mason	Labadie-Mason-3 Term. Equipment replacement	Planned



MTEP-05			0
Expected in Service Date	From:	То:	Current Status
Jun-07	Mason	Replace 4-138 kV Breakers	Planned
Jun-07	Meramec Plant	Apache Flats	Planned
Jun-07	Moreau	N. Ottawa (new 3 terminal ring bus)	Planned
Jun-07	N. LaSalle (138 kV breaker addition)	Ottawa (2 new 138 kV breakers)	Planned
Jun-07	N. Ottawa	Wedron	Planned
Jun-07	N. Ottawa	Replace 6-138 kV	Planned
Jun-07	Wildwood	Gray Summit (reconductor)	Planned
Jun-07	Wildwood	Gray Summit (reconductor)	Planned
Jun-07	Wood River	Gillespie (reconductor)	Planned
Jun-07	Femrite	Sprecher (new 138 kV)	Planned
Jun-07	Jefferson	Lake Mills	Planned
Jun-07	Kegonsa	McFarland (conversion to 138 kV)	Planned
Jun-07	Lakehead Cambridge	Jefferson	Planned
Jun-07	Lawn Road	White Clay	Planned



MTEP-05 Expected in Service			Current
Date	From:	То:	Status
Jun-07	McFarland	Femrite (conversion to 138 kV)	Planned
Jun-07	Morrison Ave	Sherman St	Planned
Jun-07	North Appleton	Lawn Road	Planned
Jun-07	Plymouth	Forest Junction / Charter Steel	Planned
Jun-07	Reiner	Sycamore (conversion to 138 kV)	Planned
Jun-07	Rockdale	Boxelder	Planned
Jun-07	Rockdale	Lakehead Cambridge	Planned
Jun-07	Sprecher	Reiner (conversion to 138 kV)	Planned
Jun-07	Weston	Hilltop	Planned
Jun-07	Weston	Morrison Ave	Planned
Jun-07	Weston	Sherman St	Planned
Jun-07	Air Lake	Vermillion River	Planned



MTEP-05 Expected in			
Service Date	From:	То:	Current Status
Jun-07	Lone Jack	Greenwood	Planned
Jul-07	Fenton	Chanarambie	Planned
Jul-07	Nobles Co	Lakefield Jct	Planned
Jul-07	Nobles Co	Fenton	Planned
Jul-07	Nobles Co 345-115 kV		Planned
Jul-07	Split Rock	Nobles Co	Planned
Dec-07	Rutland	Winnebago	Planned
Dec-07	Chisago	Lindstrom	Planned
Dec-07	Lawrence Creek	St Croix Falls	Planned
Dec-07	Lawrence Creek 161-115 kV		Planned
Dec-07	Lindstrom	Shafer	Planned
Dec-07	Shafer	Lawrence Creek	Planned
Dec-07	St Croix Falls	Apple River	Planned



# **DA – Binding Constraints**

## April 1, 2005 to December 21, 2005

CONSTRAINT	BRANCH INFO	Total
MWSI_PTDF	ARPIN ARPINEAU_C34_1 1(LN,ALTE,NSP); PR_ISLD PR_IS	1,262
CULLEY CULLEGRAND13_11 LN	CULLEY CULLEGRAND13_1 1(LN,SIGE,SIGE)	1,087
FLWSOUPTDF	AMBERG 64443 64(LN,WEC,WEC); MGN 35321 35(LN,WEC,W	1,030
TYRONE TYRONE_FRNKF_E1 LN	TYRONE TYRONE_FRNKF_E 1(LN,LGEE,LGEE)	1,009
EAUARP_XCEL_PTDF	ARPIN ARPINEAU_C34_1 1(LN,ALTE,NSP)	650
HIGHWAYVHIGHWAYVPREB1 HILN	HIGHWAYV HIGHWAYVPREB1 HI(LN,WPS,WPS)	601
NEWTNV A XFMR	NEWTNV A A(XF,SIGE,N/A)	593
HENDERSOHENDEABBRO13_11 LN	HENDERSO HENDEABBRO13_1 1(LN,BREC,SIGE)	584
CRSW2 ALBS-NORN-1 A LN	CRSW2 ALBS-NORN-1 A(LN,AMRN,AMRN)	510
LIME_CK LIME_EMERY16_11 LN	LIME_CK LIME_EMERY16_1 1(LN,ALTW,ALTW)	495
DA WAY	WAY TX00 WAY_T10(XF,WEC,N/A)	461
HAZLTON HAZLTDUNDE16_11 LN	HAZLTON HAZLTDUNDE16_1 1(LN,ALTW,ALTW)	450
PADDOCK PAD_T210 XFMR	PADDOCK TX00 PAD_T210(XF,ALTE,N/A)	434
MHEX_S_PTDF	DSY5 ROSEADORSE50_1 1(LN,MHEB,NSP); GLEN2 GLENBRUG	402
DA DETOUR XFM	DETOUR T2 T2(XF,WEC,N/A)	362
COOPER_S_PTDF	COOPER COOPEFAIRP34_1 1(LN,NPPD,AECI); ST_JOE ST_J	358
GREEN_RLGRN_R_ST_GR_RV1 LN	GREEN_RL GRN_R_ST_GR_RV 1(LN,LGEE,LGEE)	339
PEAVYFAL_TX00_PEA_TR10_XF	PEAVYFAL TX00 PEA_TR10(XF,WEC,N/A)	335
PEAVYFAL_TX01_PEA_TR20_XF	PEAVYFAL TX01 PEA_TR20(XF,WEC,N/A)	334
HODENPYJHODENTIPPY13_11 LN	HODENPYJ HODENTIPPY13_1 1(LN,CONS,CONS)	324
PWR_JCT 38L13521 38LN	PWR_JCT 38L13521 38(LN,IP,CE)	319



# **RT - Binding Constraints**

#### April 1, 2005 to December 21, 2005

CONSTRAINTNAME	BRANCH INFO	Total
Kammer_8_xfmr_I_o_Belmont_Harrison_500	KAMMER _200 _200(XF,AEP,N/A)	1,095
Frankfort_East_Tyrone_138_flo_Ghent_West_Le xingt	TYRONE TYRONE_FRNKF_E 1(LN,LGEE,LGEE)	1,023
EAU_CLAIRE_ARPIN_345_KV	ARPIN ARPINEAU_C34_1 1(LN,ALTE,NSP)	882
PRNTY_MTSTM500_BLACKO_BEDNGT500	8MT_STM 8MT_ST01PRN5_1 A(LN,VAP,AP)	464
BRE16X01_CULLEY_CULLEGRAND13_1_1	CULLEY CULLEGRAND13_1 1(LN,SIGE,SIGE)	392
	INTF: AMBERG 64443 64(LN,WEC,WEC); MGN 35321 35(LN	388
BRESIG02_CULLEY_CULLEGRAND13_1_1	CULLEY CULLEGRAND13_1 1(LN,SIGE,SIGE)	380
Wylie_Ridge_7_tx_I_o_Wylie_5_tx_SPS_in_servi	WYLIERID AN_7 TRAN_7(XF,AP,N/A)	
ce		371
MWSI	INTF: ARPIN ARPINEAU_C34_1 1(LN,ALTE,NSP); PR_ISLD	323



# **SERC**



In-Service Date	Main Owner	From:	To:
Jun-06	Entergy Services, Inc.	Lakeover	Mansdale
Jun-06	Entergy Services, Inc.	Ninemile	Waggaman
Jun-06	Entergy Services, Inc.	Perryville	Sterlington
Jun-06	Entergy Services, Inc.	Waggaman	Waterford
Dec-06	Entergy Services, Inc.	Bogue Chitto	Bogalusa
Dec-06	Entergy Services, Inc.	Bogue Chitto	Franklin
Dec-06	Entergy Services, Inc.	Coly	Hammond
Dec-06	Entergy Services, Inc.	Hammond	Amite
Dec-06	Entergy Services, Inc.	Panama	Dutch Bayou
Jun-07	Entergy Services, Inc.	Cypress	Jacinto
Jun-07	Entergy Services, Inc.	Jacinto	Lewis Creek
Jun-07	Entergy Services, Inc.	Yandel	Bozeman
Dec-07	Entergy Services, Inc.	Mabelvale	Little Rock South
Dec-07	Entergy Services, Inc.	Mabelvale	Little Rock South



In-Service Date	Main Owner	From:	То:
Apr-07	Alabama Power Company	Ashland T.S.	Gaston S.P.
Apr-07	Alabama Power Company	Ashland T.S.	Roopville
May-07	Alabama Power Company	Prattville CT TS	County Line Road
Dec-07	Alabama Power Company	Turf Club T.S.	Boyles T.S.
Dec-07	Alabama Power Company	Turf Club T.S.	Gaston S.P.
Sep-06	Georgia Power Company	CEDARTOWN	ARAGON
Jun-07	Georgia Power Company	CUMMING	SHOAL CREEK
Jun-07	Georgia Power Company	HOPEWELL	MCGRAW FORD
Jun-07	Georgia Power Company	MCGRAU FORD	MOSTELLAR SPRINGS
Jun-06	Georgia Transmission Corporation	Dresden	South Coweta
Jun-07	Georgia Transmission Corporation	Anthony Shoals	Evans
Jun-07	Georgia Transmission Corporation	McGraw Ford	Cumming
Jun-07	Municipal Electric Authority of Georgia	Fort Valley Tap	Fort Valley #1
Jun-06	Tennessee Valley Authority	Cumberland	Montgomery



In-Service Date	Main Owner	From:	То:
May-06	Dominion Virginia Power	Clark	ldylwood
Nov-06	Dominion Virginia Power	Midlothian	Winterpock
May-07	Dominion Virginia Power	Morrisville	Brister
May-07	Dominion Virginia Power	Pleasant View	Hamilton
Dec-07	Dominion Virginia Power	Fredericksburg	Possum point
Jun-06	Progress Energy Carolinas	Clinton	Lee
Jun-07	Progress Energy Carolinas	Florence	Marion
Jun-07	Progress Energy Carolinas	Kinston DuPont	Greenville
Jun-07	Progress Energy Carolinas	Marion	Whiteville
Sep-06	South Carolina Public Service Authority	Cross	Kingstree No 2
Dec-06	South Carolina Public Service Authority	Hemingway	Red Bluff
Jun-07	South Carolina Public Service Authority	Mateeba	Johns Island No 2



#### **SPP Expansion Planning - 2003**

- Phase I of the SPP RTO Expansion Plan (2003) identified five major projects and many smaller projects:
  - Finney-Lamar 345 kV and DC tie (to WECC) -12/04
  - OGE Draper 345/138kV transformer 6/05
  - AEP Chambers Springs Tontitown 345 kV 6/07
  - AEP Flint Creek East Centerton 345 kV 6/10
- The crityeria used for screening were reliability



#### **SPP Expansion Planning - 2005**

- The Phase II plan (SPP RTO Expansion Plan 2005-2010) initially screened 33 projects
- Four projects were selected for further analysis:
  - Tulsa East Switching Station
  - Sooner-Cleveland 345 kV line
  - Rose Hill Sooner 345 kV line
  - Tolk Potter 345 kV line



#### **SPP Phase II Economic Screening Methodology**

- SPP used Global Energy's MarketSym and the PowerWorld Simulator (AC OPF) to model SPP and first-tier companies
- SPP compared the NPV over a 10-year period of:
  - The savings in dispatch costs *plus* the cost of violating constraints with
  - The project cost
- The four projects identified all had benefit/cost ratios greater than 1.0
- The cost of violating constraints was set at:
  - \$45/MWh for up to 2% over a flowgate limit
  - \$90/MWh for flowgate violations of more than 2%
  - Branches or transformers above normal rated capacity \$30/MWh



# SPP Phase II Economic Screening Methodology (continued)

#### The screening methodology was:

- Simulate July 2005 using a typical week representation with and without the project
- Double the July savings to represent a full year
- Compute the 10-year NPV at 8%

#### Observations:

- The single month simulation is not sufficient
- Allowing a 2% violation might be acceptable for a short duration, but may not be sustainable
- "More than 2%" presumably can mean a very large overload
- \$30, \$45 and \$90/MWh are quite low and could lead to odd results in which the PowerWorld Simulator overloads lines for economic savings



# **CERA Study**



#### **Overview**

- CERA used GE MAPS
- Used 2002 Series MMWG Summer 2003 Case load flow
- Added four new lines to the load flow
  - Wyoming Jackson's Ferry
  - Arrowhead Weston
  - Callaway Franks
  - Cross sound cable (CT to LI)
- CERA assumed that by 2010 there would be no wheeling charges within the El
- Losses modeled as wheeling fees between regions. According to a former CERA staff member with detailed knowledge of the analysis, loss costs did not play a major role in congestion cost results



#### Methodology

- Ran GE MAPS and identified constraints that resulted in significant congestion as measured by congestion costs
  - Results were summarized by region and ranked by congestion costs within each region
  - The next set of slides compares CERA's results to available congestion data
- CERA estimated the cost of relieving what they found to be the major transmission bottlenecks, and compared estimated costs to estimated congestion costs
  - CERA had study participant input on the transmission projects
  - CERA used generic component costs



#### **Classic PJM Results**

	CERA 2010 Results			2004-2005 Market Data					
	Time Binding	Co	ongestion Costs	Real Time Day-Ahead		TLR			
Constraint	(percent)		(million dollars)	Hours Constraine d	% Hours Constrai ned	Hours Constraine d	% Hours Constrai ned	Hours	% of Hours
FG2353 Blackko-Bedngt500-Prnt	60%	\$	377.0	3,061	17.5%	6,831	39.0%	336	1.9%
FG50 AP-South Interface	8%	\$	61.0	60	0.3%	384	2.2%		
FG20 Erie West-Erie South	40%	\$	42.0	204	1.2%	535	3.1%		
1-Trips, Midd Jct-Humlstn-1	5%	\$	22.0	55	0.3%	51	0.3%		
FG2358 01 Wylier 345/500TX5-0	31%	\$	20.0	1,465	8.4%	1,247	7.1%	3537	20.2%
VEM;HATFL-YUKON; BEDNG- DOUB	14%	\$	15.0	19	0.1%				
FG2359 01DOUBS 500/230 XFMR	4%	\$	14.0	1,341	7.7%	1,296	7.4%		
1-TRIPS, LEWIS RN-FARM.VLY-1	20%	\$	13.0	19	0.1%				
INTERFACE=PJM-WESTERN	7%	\$	13.0	436	2.5%	529	3.0%		
LINDEN 1 138-NORTH AV 138-1	26%	\$	10.0	83	0.5%	304	1.7%		
FG2360 01AQUEDT STATIONH 230	5%	\$	9.0						
1-TRIPS, RITCH058-BENN 230-1	36%	\$	8.0						
PAR, O ST 138 1-O ST T5 1-1	73%	\$	4.0						
PAR, O ST 138 1-O ST T6 1-1	73%	\$	4.0						

**Green Font Denotes Potential Corridor Components** 



## PJM Classic Actual Binding DA Constraints 2004-2005

MONITORED FACILITY	CONTINGENCY FACILITY	DAY AHEAD CONTINGENCY EVENT	Grand Total	Identifie d by CERA?
BED-BLA	Pruntytown-Mt. Storm (510) 500 kV line	BED-BLA L/O Pruntytown-Mt. Storm (510) 500 kV line	7.905	Yes
CEDARGRO230 KV CED-CLIK	Roseland-Cedar Grove- Clifton-Athenia (B-2228) 230	CEDARGRO230 KV CED-CLIK L/O Roseland-Cedar Grove-Clifton-Athenia (B- 2228) 230	3,513	No
Cedar Interface	ACTUAL	Cedar Interface	2,867	No
EAST	ACTUAL	Eastern Interface	2,686	No
HOMERCIT345 KV HOM-WAT	ACTUAL	HOMERCIT345 KV HOM-WAT	2,588	No
CENTRAL	ACTUAL	Central Interface	2,006	
BEDINGTO138 KV BED-NIP	BEDINGTON DOUBS LINE	BEDINGTO138 KV BED-NIP L/O BEDINGTON DOUBS LINE	1,636	No
BERGEN 230 KV BER-HOB	Hudson-Penhorn-Bellville-N. Bergen-Bergen (X-2250)	BERGEN 230 KV BER-HOB L/O Hudson- Penhorn-Bellville-N. Bergen-Bergen (X- 2250)	1,565	No



# PJM Classic Actual Binding DA Constraints 2004-2005 (continued)

MONITORED FACILITY	CONTINGENCY FACILITY	DAY AHEAD CONTINGENCY EVENT	Grand Total	Identified by CERA?
LAUREL 69 KV LAU- WOO	CUMBERLAND AE- CHURCHTOWN 230 LINE	LAUREL 69 KV LAU-WOO L/O CUMBERLAND AE-CHURCHTOWN 230 LINE	1,504	No
50045005 4	Hunterstown-Conastone (5013) & Hunterstown #1 xfmr	50045005 4 L/O Hunterstown-Conastone (5013) & Hunterstown #1 xfmr	1,299	No
BERGEN 230 KV BER- LEO	ACTUAL	BERGEN 230 KV BER-LEO	1,240	No
BRANCHBU500 KV 500-5	BRANCHBURG-DEANS & DEANS 500-1 & SOMERVILLE RELAY	BRANCHBU500 KV 500-1 L/O BRANCHBURG-DEANS & DEANS 500-1 & SOMERVILLE RELAY	1,210	No
SHIELDAL69 KV SHI- VIN	CUMBERLAND AE- CHURCHTOWN 230 LINE	SHIELDAL69 KV SHI-VIN L/O CUMBERLAND AE-CHURCHTOWN 230 LINE	1,175	No
SHIELDAL69 KV SHI- VIN	CHAMBERS-CHURCHTOWN	SHIELDAL69 KV SHI-VIN L/O CHAMBERS-CHURCHTOWN	1,156	No
BRANCHBU500 KV 500-4	BRANCHBURG-DEANS & DEANS 500-1	BRANCHBU500 KV 500-1 L/O BRANCHBURG-DEANS & DEANS 500-1	894	No



### **NYSIO** Results

	CERA 201	10 Results	2004-2005 Market Data			
	Time Binding	Congestion Costs	Real Time		Day-Ahead	
Constraint	(percent)	(million dollars)	Hours Constraine d	% Hours Constr ained	Hours Constrain ed	% Hours Const rained
13 INTERFACE=VOLNEY-EAST OPN	15	18				
STA 162 115-STA 158S 115-1	29	11				
LEEDS-PLVLLEY; A-PV	2	11	2,809	16.0%	735	4.2%
PAR,RAM PAR 3-RAMAPO 3-1	42	3	561	3.2%	10	0.1%
PAR,GOWNUS1R 1-GOWNUS1T 1-1	10	3				
PAR,GOWNUS2T 1-GOWNUS2R 1-1	10	3				
1-TRIPS,DUNWCDIE-SHORE RD-1	14	6	9,412	53.7%	11,428	65.2%
SPRBROOK 345-DVNPT NK 345-1	10	2				



# **Entergy Results**

	CERA 20	010 Results	2004-2005 Market Data		
	Time Binding	Congestion Costs	Т	LR	
Constraint	(percent)	(million dollars)	Hours	% of Hours	
FG1307 RICHARD500-138(1) FOR	33%	188			
FG1375 BAGATELLE-SUNSHINE FLO WATERF-WGLEN	18%	56	15	0.1%	
FG5076 FTSMTHANOVLT	17%	20			
FG1382 HAYTI-BLYTHEVILLE FLO NMAD-DEL	17%	23	30	0.2%	
FG1380 BATESVILLE-MARKS FLO BATESV-ENID	13%	42	5	0.0%	
FG1389 MURFREESBORO 138/115	21%	19			
FG1374 CONWAY-BAGATELLE FLOW WATERF-WGLEN	8%	17			
FG1376 COLY-VIGNES FLO WATERF-WGLEN	4%	15	7	0.0%	
FG5058 TOLED-LEESV FLO CARMES	5%	8			



### **SPP Results**

	CERA 2010 Results		2004-2005 Market Data	
	Time Binding	Congestion Costs	TLR	
Constraint	(percent)	(million dollars)	Hours	% of Hours
FG5037 MUSCLAMUSRSS	29%	125	7	0.0%
FG1002 THMMOBTHOMCC	73%	76		
FG5081 OSACANBUSDEA	51%	68		
FG5201 SILDIVNWSCIM	12%	44	5	0.0%
FG5098 PECXFRMUSCLA	12%	31	6	0.0%
FG:SPP-SPS TIES	60%	31	61	0.3%
FG5083 HARNICHARNIC	17%	24		
FG5096 MIDFRNPHAWET	7%	23		
FG5091 DRAXFRDRAXFR	3%	20		
FG:REDARCREDARC	12%	13	109	0.6%
FG:SPHWMCSUMEMC	23%	12	902	5.1%
FG:BRKCRABBTMTR	20%	9		
FG:JUDGRNSPEMUL	23%	7		
PAR,TXPHSF3 1-TEXCO3 1-1	38%	2		





#### **TASK 1 REPORT**

#### Prepared For:

U.S. Department of Energy – Office of Electricity Delivery and Energy Reliability

1000 Independence Ave, SW

Washington, DC 20585

# Review of Eastern Congestion Studies and Expansion Plans

#### Prepared By:

**CRA** International

1201 F St. NW - Suite 700

Washington, DC 20004

March 15, 2006

CRA Project No.

#### **TABLE OF CONTENTS**

1.	ISO New England Regional System Plan 2005 (RSP05)	1
2.	NYISO 2004 Intermediate Area Transmission Review of the New York State Bulk Power Transmission System	6
3.	PJM Regional Transmission Expansion Plan 2005	11
4.	Midwest ISO (MISO) Transmission Expansion Plan 2005	14
5.	Southeastern Electric Reliability Council (SERC) Transmission Planning Summary	17
6.	Tennessee Valley Authority (TVA) Annual Transmission Planning and Evaluation Report 2004	20
7.	Entergy Annual Transmission Planning and Evaluation Report 2004	22
8.	Southwest Power Pool (SPP) Expansion Plan 2005 – 2010	24
9.	Interregional Studies	29
10.	ECAR and MAIN Summer 2005 and Winter 2005/2006 Assessments	31

#### ISO NEW ENGLAND REGIONAL SYSTEM PLAN 2005 (RSP05)

PART I: CHARACTERIZATION OF THE STUDY

1. Provide the name of the study: ISO-NE Regional System Plan, October 20, 2005

#### 2. Provide the title(s) and completion dates of available report(s) regarding the study:

ISO New England relies on several types of studies to identify the resources required to meet future system reliability needs. The two most frequently used studies are the installed capacity (IC) analysis and the operable capacity (OC) analysis. RSP05 summarizes the status of a number of transmission planning studies that aim to identify needed transmission facilities. Two studies that have a significant impact on RSP05 results have focused on reliability issues in southern New England and the interface constraints for the Connecticut and Southwest Connecticut imports. RSP05 summarizes the status of a number of transmission planning studies that aim to identify needed transmission facilities. Two studies that have a significant impact on RSP05 results have focused on reliability issues in southern New England and the interface constraints for the Connecticut and Southwest Connecticut imports. Other studies include:

- 2005 CELT Report—Statistics of capacity, energy, load, and transmission, available at: <a href="http://www.iso-ne.com/trans/celt/report/index.html">http://www.iso-ne.com/trans/celt/report/index.html</a>
- 2005 Load Forecast—Peak and energy load forecasts and supporting documentation, available at: <a href="http://www.iso-ne.com/trans/celt/fsct\_detail/index.html">http://www.iso-ne.com/trans/celt/fsct\_detail/index.html</a>
- Draft 2005 Resource Adequacy Analysis—Resource adequacy report issued to the Power Supply Planning Committee for review and comment. This report does not reflect the latest comments received from the PAC on RSP05. Available at: <a href="http://www.iso-">http://www.iso-</a>
  - $ne.com/committees/comm\_wkgrps/relblty\_comm/pwrsuppln\_comm/mtrls/2005/a \\ ug182005/Draft\_ResAdqcy\_Aug10.pdf >$
- Transmission planning studies—Transmission planning and tariff reports, which can be accessed by calling ISO New England customer service (413-540-4220)
- ISO New England Project Listing Update—List of ISO-approved transmission system improvements, available at: <a href="http://www.iso-ne.com/trans/rsp/2005/july05\_update\_final\_redacted\_072105.ppt">http://www.iso-ne.com/trans/rsp/2005/july05\_update\_final\_redacted\_072105.ppt</a>
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): Web address:http://www.iso-ne.com/trans/rsp/index.html
- **4. Provide a contact person to obtain project details name, phone, email:** ISO-NE System Planning Committee, 413-540-4220
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? ISO-NE's regional transmission expansion plan (Regional System Plan 2005 or

RSP05) focuses on the following initiatives in order to address the system's transmission issues: (1) Solving so-called "pure" transmission problems related to voltage and dynamic instability in the system and upgrade equipment where existing equipment ratings are limiting flows on the system; (2) Serving load pockets that are deficient because of load growth and/or limited sources of delivery and (3) In a broader sense, assure the reliability of the network if alternative resources do not emerge when and where needed based on market incentives.

- **6. Provide a brief summary description characterizing the study:** RSP05 identifies system improvements needed over the next 10 years and provides information on what infrastructure improvements are needed and when and where they are needed to meet the system's peak demands in conformance with planning criteria. Plans for the region's future electric infrastructure must account for the uncertainty of assumptions over the next 10 years in terms of load growth, fuel prices, new technology, market changes, environmental requirements, and other relevant events. As with previous planning reports, formerly called Regional Transmission Expansion Plans (RTEPs), RSP05 provides technical information and data on various scenarios and identifies the requirements for maintaining, improving, and ensuring the reliability of the system in the short term.
- **7.** What was the geography of the study? The ISONE Market consists of the entire New England area (all of the U.S. portion of the NPCC region excluding New York.)
- **8. What was the study period?** 2005 through 2014
- 9. Describe the study type (such as who initiated the study and why): As an independent system operator (ISO), one of ISO-NE's core functions is to plan for the enhancement and expansion of transmission system capability. During 2004, the ISO signed the Northeast Planning Protocol, an agreement among ISO New England, the New York ISO (NYISO), and PJM Interconnection that commits the ISO and these transmission providers to cooperate in interregional planning studies. The protocol specifically aims to resolve interregional planning issues and identify the impacts that proposed generating units and transmission projects could have on neighboring systems. Additionally, the ISO participates in planning studies to ensure that contingencies in New England will not adversely affect neighboring systems.
- 10. Characterize the study participants: As part of the RSP05 effort, the ISO consulted with stakeholders about numerous topics, including analysis of data trends, possible future developments, and options related to the region's short- and long term electricity supply. The ISO met with the Planning Advisory Committee (PAC) eight times in 2005 to fully review RSP05 assumptions and study results. The transmission projects are the result of an ongoing planning process among the ISO and New England transmission owners. This open stakeholder process has provided benefits to regional planning in terms of study priority, scope, and quality. The ISO also fully participates with its neighboring electric power system control areas as well as interregional planning bodies, including the Northeast Power Coordinating Council (NPCC) and the North American Electric Reliability Council (NERC), to ensure the reliability and security of the widescale electric power system.5 The ISO complies with all the NERC planning criteria and procedures (as well as all internal planning procedures) to enhance resource adequacy and

transmission performance and to better coordinate the development of the interconnected power system in the Northeast.

11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: The installed capacity analysis uses a well-established probabilistic method for determining the resources needed to meet a loss-of-load-expectation (LOLE) criterion that prevents the system from disconnecting firm load for a range of possible load levels and resource availabilities. The operable capacity analysis uses a deterministic method for identifying the amount of capacity needed to be operable to meet a specified peak load level including operating reserves. The operable capacity analysis methodology is very similar to the approach system operators use to identify the resources needed on a daily basis to meet the expected peak-load conditions. Thus, installed capacity studies identify bulk power system reliability issues related to the adequacy of system resources, and operable capacity analyses identify reliability issues related to system security.

Consistent with transmission reliability requirements, the ISO continues to study the southern New England region to identify and resolve its reliability issues. An overall goal of the study is to formulate a solution that better integrates load-serving and generating facilities within Massachusetts, Rhode Island, and Connecticut. The study report is scheduled to be completed by the end of 2005, and the project plan is scheduled for ISO approval by July 2006.

- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? The ISO complies with all the NERC planning criteria and procedures (as well as all internal planning procedures) to enhance resource adequacy and transmission performance and to better coordinate the development of the interconnected power system in the Northeast. A list and description of the criteria used in determining congestion can be found at: http://www.npcc.org/publicFiles/reliability/criteriaGuidesProcedures/a-02.pdf
- **13. Congestion identified:** RSP05 identifies 272 transmission projects required throughout New England to meet planning criteria. These upgrades are required to reliably serve load and to reduce the need to commit generating units for operating reserves, voltage support, and relief of other transmission constraints. These 272 projects are estimated to cost about \$3.0 billion. Two-thirds of this cost is related to the following six major 345 kV projects:
  - NSTAR 345 kV Reliability Project
  - Northeast Reliability Interconnect (NRI) Project
  - Southwest Connecticut Reliability Project Phase 1
  - Southwest Connecticut Reliability Project Phase 2
  - Northwest Vermont Reliability Project
  - Southern New England Reinforcement Project

The load/generation pockets discussed in RSP05 include Middletown (CT); Norwalk–Stamford (CT); Southwest Connecticut; Springfield (MA); Boston; Wachusetts (MA); and the North Shore (MA). Additional studies are required to finalize many of the 272 projects, such as those required for increasing the northern New England transmission-transfer capability and improving the voltage performance of Downtown Boston.

Most of the transmission projects identified during the RSP process are reliability upgrades for ensuring the region continues to satisfy national and regional reliability standards while continuing to operate in an economical manner. Many of these upgrades will provide the additional benefit of enhancing the efficient operation of the region's power markets.

- **14.** Were non-transmission alternatives compared with transmission alternatives? ISONE states that transmission enhancements remain the most essential manner for improving the grid. Adding alternate resources (e.g. distributed generation) may solve a problem in a specific area, but a transmission solution often solves a number of problems; hence, ISONE typically considers it as a more robust alternative.
- 15. Were new transmission technologies considered? Yes. In many instances, applying advanced technology solutions has effectively solved system problems. The ISO is committed to the prudent use of new technologies and works closely with transmission owners to identify and evaluate opportunities for applying advanced technologies. The ISO also actively participates in projects sponsored by the Electric Power Research Institute (EPRI) and Power Systems Engineering Research Center (PSERC), two research organizations committed to advancing the electric power industry.

Improving the use of existing rights-of-way is a key concern. The use of compact structure design, high-temperature conductors, or real-time ratings of transmission lines can be effective techniques for increasing the thermal-transfer capabilities of the system within the existing rights-of-way land constraints. New types of underground cable, such as "XLPE," are being proposed to resolve transient over voltages and other issues where underground transmission is needed. Voltage restrictions and stability concerns often require the addition of dynamic devices that can provide continuous control. Flexible alternating current controllers, known as FACTS, use power electronics to provide an exceptionally fast and dynamic system response. To date, New England has several installations of STATCOMs and SVCs, devices capable of providing instantaneous voltage support, and more are planned. The use of advanced control systems, possibly including adaptive control, also may provide system benefits. The power industry is developing new types of synchronous condensers, some of which use superconductors. All these innovative voltage-control technologies will become increasingly important for addressing load-pocket voltage concerns. In addition, improved methods and software can be applied to optimize the use of existing voltage-control equipment.

#### 16. Describe the most important study assumptions (e.g. fixed hydro dispatch):

The installed capacity (IC) analysis assumes the following:

• That no transmission constraints exist within New England so that all generating resources in the region are available to all loads.

- The load forecast is modeled as a probability distribution of the weekday peak loads that accounts for the effects of weather uncertainty.
- The availability of resources is modeled based on the probability of forced outages.
- The transmission system can be operated reliably when system-wide operating reserves have been fully depleted.
- No generating units will be added or removed from the system during the assessment period.
- To meet emergency needs throughout the assessment period, New England can rely on 2,000 MW of uncontracted or otherwise unscheduled capacity (called tie benefits) from New York, Québec, and the Maritimes to meet needs.
- All ISO New England emergency actions per Operating Procedure No. 4, Actions during a Capacity Deficiency (OP 4), will be fully available during a capacity deficiency.
- While over 1,700 MW of New England generating capacity has been retired since 1999, RSP05 assumes no additional generators will retire during the 10-year planning period.
- The long-run peak load forecasts in RSP05 assumed a constant load factor, which
  has been found to be inconsistent with historical data and short-term forecasts and
  has contributed to the under-forecasting of summer-peak loads. The ISO is in the
  process of improving its peak-forecast methodology by extending its declining
  summer-peak load factor over the entire forecast period.
- ISONE assumes the current approved levels of tie-reliability benefits are 2,000 MW
- The operable capacity analysis assumed 1,700 MW of operating reserves.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

#### **ISO-NE TRANSMISSION EXPANSION PROJECTS**

### NYISO 2004 INTERMEDIATE AREA TRANSMISSION REVIEW OF THE NEW YORK STATE BULK POWER TRANSMISSION SYSTEM

#### PART I: CHARACTERIZATION OF THE STUDY

- 1. What was the name of the study? 2004 Intermediate Area Transmission Review of the New York State Bulk Power Transmission System (NYSBPTS) (Study Year 2009)
- 2. Provide the title(s) and completion dates of available report(s) regarding the study: NYISO 2005 Load and Capacity Data; NYISO Annual Transmission Planning And Evaluation Report (FERC Form NO. 715) April 2005
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): Web address: http://www.nyiso.com/public/services/planning/index.jsp. Report also may be obtained by contacting Steven Corey at scorey@nyiso.com
- **4. Provide a contact person to obtain project details:** name, phone, email: Steven Corey, (518) 356-6134, scorey@nyiso.com
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? The purpose of the study was to determine whether NYISO is in conformance with the Northeast Power Coordinating Council's (NPCC) "Basic Criteria for Design and Operation of Interconnected Power Systems" and the reliability criteria described in the NYSRC Reliability Rules. The study uses power flow and stability analyses to evaluate the thermal, voltage and stability performance of the New York State Bulk Power System for normal (or design) and extreme contingencies as defined in the NPCC and NYSRC reliability criteria and rules.
- **6. Provide a brief summary description characterizing the study:** The study examined the 2004 through 2009 time frame based upon resource and transmission projects permitted or under construction for operation by 2009.
- 7. What was the geography of the study? The State of New York
- 8. What was the study period? 2009
- **9. Describe the study type (such as who initiated the study and why):** The Guidelines for NPCC Area Transmission Reviews require each Area to conduct a Comprehensive Review at least every five years and either an Interim Review or an Intermediate Review in each of the intervening years between comprehensive reviews, as appropriate. The most recent comprehensive review of NYSBPTS was presented by NYISO staff in July 2000 and covered the year 2006. Since then, three intermediate reviews were conducted in 2001, 2002 and 2003 covering years 2006, 2007 and 2008, respectively. This intermediate review focuses on year 2009 with an updated forecast of system conditions, including a significant number of proposals for new generation in the New York Control Area (NYCA) since the last intermediate review.

**10.** Characterize the study participants: The study was conducted under the auspices of the NYISO Transmission Planning Staff for presentation to the NPCC Task Force on System Studies and the New York State Reliability Council. Principal contributors include Eric Allen, Laura Popa, and Thinh Nguyenand.

11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: The procedure used to evaluate the performance of NYSBPTS consists of the following basic steps: (1) develop a mathematical model (or representation) of the New York State and external electrical systems for the period of study (in this case, the year 2009), (2) develop various power flow base cases to model the system conditions (load and power transfer levels, commitment and dispatch of generation and reactive power devices) to be tested, and (3) conduct power flow and stability analysis to determine whether or not the transmission system meets NYSRC Reliability Rules and NPCC Basic Criteria for thermal, voltage and stability performance. In actual practice, steps (2) and (3) are interwoven during the conduct of a study, and the detailed procedures differ for the various types of analyses conducted.

For thermal analyses, the contingencies examined include the individual opening of all lines connected between buses with base voltage between 100 kV and 765 kV. Phase angle regulators maintain their scheduled power flow pre-contingency but are fixed at their corresponding pre-contingency angle post-contingency. The general direction of generation shifts is from the North and West to Southeastern New York and New England. When an interface besides the one being studied became limiting, the general shift pattern was modified, within the base case conditions and limitations, to minimize this effect. However, no attempt was made to find the maximum thermal limit based on an ideal shift pattern.

The voltage analysis was conducted using PTI's PSS/E (Rev. 28) in conjunction with the NYISO Voltage Contingency Analysis Procedure (VCAP). VCAP is used to evaluate voltage-based transfer limits in accordance with the NYISO Transmission Planning Guideline #2-0 [8], and with consideration of the Voltage limit criteria (Exhibit A-3 of NYISO Emergency Operation Manual [11], formerly known as OP-1 criteria) which specifies minimum and maximum voltage limits at key NYSBPS buses. The required post-contingency voltage is typically within 5% of nominal. A set of power flow cases with increasing transfer levels was created from the 2009 summer peak load base case. The generation shifts that were employed for VCAP are similar to the ones used for the thermal analysis. These shifts were used to obtain an increase in transfers across the particular interface being studied.

In the stability analysis, three cases were used: two summer peak stability margin cases (margin case and West Central margin case) and a light load case. The UPNY-SENY interface of the margin case is loaded at 6,888 MW. This flow is 11.1% above the more restrictive of the emergency thermal or voltage limit. This case has all Oswego complex generation dispatched at an output of 4,460 MW and 1,180 MW of import from Hydro Quebec using only Beauharnois units. The dynamic representation used in this analysis was developed from the 2003 NPCC Base Case Development library. The real power load models used for various Areas were (1) constant current (power varies with the voltage magnitude) for Hydro Quebec, New Brunswick, MAAC, and ECAR, (2) constant impedance (power varies with the square of the voltage

magnitude) for New York and New England, and (3) 50% constant current/50% constant impedance for Ontario and Nova Scotia. Reactive load was modeled as constant impedance for all Areas except Hydro Quebec, which uses a 13% constant current/87% constant impedance model for reactive load.

For the extreme contingency analysis, each contingency was tested for dynamic stability, voltage, and thermal limits. A total of 38 extreme contingencies including loss of entire substations, loss of entire generation plants, and loss of all circuits along a transmission right-of-way were evaluated. All extreme contingencies start with the same initial conditions. Since extreme contingencies are considered low probability events they were not tested against the peak summer case used for normal contingencies. Instead, a power flow case was developed from the summer peak base case with the load reduced by approximately 20%. The generation dispatch of the NYCA system was modified to obtain transfer levels on the key NYCA interfaces of approximately the 75th percentile of expected maximum transfer levels. In order to test the ability of the system to return to a stable operating point after a disturbance, dynamic simulations are performed.

The study also performed a short circuit (SC) analysis. The SC Guideline requires that all lines, feeders, and generating units be placed in service regardless of whether or not the system can actually be operated that manner. This assumption would provide an adequate design margin of safety and reliability by yielding the worst case, most conservative fault levels. In addition, the SC Guideline requires that Flat Gen voltage profile (pre-fault voltage of 1.0 per unit behind the generator subtransient reactance) be used, 30 degree phase shift in delta-wye transformer configurations be taken into account, and all loads and shunts be ignored. Three phase, two phase to ground, and single line to ground faults were applied at selected substations obtained from the NY transmission and generation owners. The highest of these three faults was compared against the respective station lowest circuit breaker rating to determine whether or not the circuit breaker is overdutied.

- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? The study did not explicitly define the term "congestion." However, congestion was assumed to be occurring when transfer limits were exceeded with path limits removed. Also, the study examined whether voltage irregularities resulted from equipment being taken out of service.
- 13. Congestion identified: The thermal analysis results showed that Dysinger East and West Central transfer limits are lower than the 2000 comprehensive review by around 75 MW and 175 MW, respectively. This reduction was due to Russell generation retirement. In addition, the reduction in the closed versions of Dysinger East and West Central interfaces was also due to the change in definition of these interfaces It is noted that Dysinger East and West Central emergency transfer limits of this year's review could be further reduced by 100 MW and 200 MW, respectively, if the exception of New York Power Pool Operating Policy #1 is recognized by NPCC or NYSRC. The first and second non-BPS limiting facilities are the Lappins Insulator-North Leroy Tap 115 kV line and the Sour114-Mortimer 115 kV line for the loss of Niagara-

Rochester 345 kV line. Sprain Brook Dunwoodie South transfer limits are lower than the previous intermediate review as the results of different generation dispatch. It is noted that Sprain Brook Dunwoodie South transfer limits could potentially be reduced by the Mott Haven project. It was noted that the potential reduction of the thermal limit of the Sprain Brook Dunwoodie South interface could be mitigated by implementing a special protection systems (SPS) device that cross-trips the Dunwoodie-South Bronx 345 kV line for the loss of the South Bronx-Rainey 345 kV circuit or changing the network configuration of South Bronx station. Long Island imports are higher than the previous intermediate review due to the addition of PJM-LI HVdc tie to the Long Island import interface definition. The other intra-area transfer limits were not evaluated because the system conditions near those interfaces have not changed significantly since the previous intermediate review or Flat Rock SRIS. Inter-area limits between New York and Ontario, and New York and New England were not calculated because system conditions near Ontario or New England border have not changed significantly since the previous intermediate review.

For the voltage analysis, the pre-contingency voltage profile of the bulk transmission system was found to be acceptable. OP-1 pre-contingency, normal, and emergency Dysinger East (open) and West Central (open) are somewhat higher than the previous comprehensive review as the results of more local generation being dispatched and the addition of shunt capacitors of the Rochester Transmission project. The voltage collapse points of Dysinger East (open) and West Central (open) are lower than the previous comprehensive review as the results of load growth and Russell generation retirement; however, Dysinger East (open) voltage-constrained transfer limit is still higher than the previous comprehensive review. As in thermal, the voltage-constrained transfer limits of the closed versions of these two interfaces are affected by the addition of the RECO ties to the interface definition. This addition changes the voltage limits across the closed versions of these two interfaces.

The stability analysis showed that for margin and light load cases, all contingencies were stable and damped. However, contingencies involving three-phase faults around the Edic and Marcy 345 kV substations (e.g., fault at Edic resulting in loss of Edic-New Scotland or fault at Marcy resulting in loss of Marcy-New Scotland) appear to adversely impact the Flat Rock Wind project. Investigation of these results revealed that the generator model used to simulate the response of the wind project to these contingencies needs to be modified and updated before these results can be finalized. PTI and GE are in the process of fine tuning and improving the model. Performance results for the Flat Rock wind project will be validated in the Annual Transmission Reliability Assessment.

In the extreme contingency analysis, most of the contingencies simulated were stable and showed no thermal overloads over the STE rating or significant voltage violations or deviations on bulk power facilities. Some contingencies showed voltage violations, significant voltage drops, and/or thermal overloads on the underlying 115 kV subtransmission system, but these conditions were local in nature. Five of the contingencies (EC12, EC30, EC31, EC32, and EC35) showed that Flat Rock project tripped because of overfrequency or undervoltage relay; however, the results of Flat Rock Wind project tripped by the overfrequency relay cannot be finalized because PTI GE wind model needs to be modified and updated.

Based on the short circuit study results, there are eleven stations with overdutied breakers. Of these stations, four are 345kV stations, one is 230 kV station, and six are 138 kV stations

#### 14. Were non-transmission alternatives compared with transmission alternatives?

No.

#### 15. Were new transmission technologies considered? No

#### 16. Describe the most important study assumptions (e.g. fixed hydro dispatch):

One major modification was that all of the Class 2004 projects were dispatched to their maximum output levels (most were initially dispatched at zero output) and the corresponding redispatch required to accomplish this was done in a manner to relieve base case thermal overloads. The other major modification was to set Branchburg-Ramapo, Linden-Goethals, and Hudson-Farragut PAR schedules according to the 2004 Multi-Area Model Working Group (MMWG) schedules.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

#### PJM REGIONAL TRANSMISSION EXPANSION PLAN 2005

#### PART I: CHARACTERIZATION OF THE STUDY

- **1. What was the name of the study?** PJM Regional Transmission Expansion Plan September 2005
- 2. Provide the titles and completion dates of available report(s) regarding the study: N/A
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): Web address: <a href="http://www.pjm.com/planning/reg-trans-exp-plan.html">http://www.pjm.com/planning/reg-trans-exp-plan.html</a>
- **4. Provide a contact person to obtain project details: name, phone, email:** Transmission Expansion Advisory Committee, 866-400-8980
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? The Regional Transmission Expansion Plan (RTEP) is PJM's process to identify transmission system upgrades and enhancements to provide for the operational, economic and reliability requirements of its customers. RTEP applies planning and reliability criteria over a five-year horizon to identify transmission constraints and other reliability concerns. Then, RTEP looks for transmission upgrades and other projects that can mitigate constraints and reliability problems, examining their feasibility, impact and costs.
- **6. Provide a brief summary description characterizing the study:** PJM establishes a baseline for a five-year period from which the need and responsibility for transmission system enhancements can be determined. PJM's approach is to use load flow modeling along with the following to ascertain its transmission planning needs:
  - transmission-owner-identified project proposals
  - long-term firm transmission service requests
  - generation interconnection requests
  - generation retirements
  - load-serving entity capacity plans
  - transmission enhancements to alleviate persistent congestion
  - distributed generation and self-generation developments
  - demand response and energy efficiency
  - proposed merchant transmission projects
- **7.** What was the geography of the study? The PJM Market, which consists of parts or all of the following states: Delaware, Maryland, New Jersey, Pennsylvania, Ohio, West Virginia, Virginia, Indiana, Illinois, Kentucky, and Michigan. A very small area of Tennessee is also included.
- **8. What was the study period?** 2005 to 2010 time frame.

**9.** Describe the study type (such as who initiated the study and why): As a regional transmission organization (RTO), one of PJM's core functions is to plan for the enhancement and expansion of transmission system capability.

- 10. Characterize the study participants: PJM's RTEP process is collaborative from start to finish and includes opportunities for stakeholders to help PJM improve the grid.. The Transmission Expansion Advisory Committee (TEAC) activities provide the primary forum for the ongoing exchange of ideas, discussion of issues and presentation of planning process results. PJM governing committees such as the PJM Members Committee, Planning Committee and Transmission Owners Agreement Administrative Committee provide additional opportunity for stakeholders to provide process input. PJM ad hoc stakeholder groups are periodically commissioned to address specific issues. Recent groups have addressed such issues as economic planning processes and FERC interconnection rulemakings. Jurisdictional liaisons foster two-way communication and resolution of planning issues with legislative and regulatory bodies.
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: PJM performs a comprehensive load flow analysis of the ability of the grid to meet reliability standards, taking into account forecasted firm loads, firm imports and exports to neighboring systems, existing generation and transmission assets, and anticipated new generation and transmission assets. The baseline reliability assessment identifies areas where the planned system is not in compliance with applicable NERC and regional reliability council (MAAC, ECAR, MAIN or SERC) standards, nuclear plant licensee requirements and PJM reliability standards. The baseline assessment develops and recommends enhancement plans to achieve compliance.
- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? The study does not explicitly state pre-set criteria that PJM uses for defining congestion. Instead, the study says that PJM determines transmission system reinforcements needed to maintain national and regional reliability standards. These reinforcements are built by transmission owners and paid for by customers in proportion to benefit.
- **13.** Congestion identified: For this October update to the 2005 Plan, the 2010 baseline assessment resulted in the need for transmission upgrades in several transmission zones. Below are the major projects included in the 2005 Plan:
  - PSE&G Zone: Convert existing Bergen Leona 138 kV circuit to 230 kV \$20 Million; Reconfigure New Freedom substation to provide for an operating spare 500/230 kV single phase transformer \$6 M
  - JCP&L Zone: Install 72 MVAR capacitor at Cookstown \$1 M
  - PECO Zone: Install 570 MVAR of capacitors at Planebrook, Newlinville and Heaton - \$8.2 M
  - AE Zone: Installation of new 500 kV substation, new 230 kV substation and new 500/230 kV transformer \$46 M; Reconductor Union Corson 138 kV circuit \$6 M; Install 50 MVAR capacitor at Cardiff \$2.6 M

- Eastern MAAC Region: Modeling changes provided by the Transmission Owners and identification of specific capacitors locations resulted in the removal of 1000 MVAR of capacitor requirement in 2008 (\$20 M)
- PEPCO Zone: Install two new Palmers Corner Blue Plains 230 kV circuits \$70
   M
- AP Zone: Install 450 MVAR SVC at Black Oak 500 kV \$27 M; Install third Wylie Ridge 500/345 kV transformer - \$12 M
- Met-Ed Zone: Install 230 kV series reactor and 2-100 MVAR PLC switched capacitors at Hunterstown \$13 M
- **14.** Were non-transmission alternatives compared with transmission alternatives? RTEP integrates alternative bulk power system factors including: distributed generation and self-generation developments and demand response and energy efficiency.
- 15. Were new transmission technologies considered? No
- **16.** Describe the most important study assumptions (e.g., fixed hydro dispatch): None mentioned.

PART II: CHARACTERIZATION OF PROPOSED PROJECTS

**PJM TRANSMISSION EXPANSION PROJECTS** 

#### MIDWEST ISO (MISO) TRANSMISSION EXPANSION PLAN 2005

#### PART I: CHARACTERIZATION OF THE STUDY

- **1. What was the name of the study?** Midwest ISO Transmission Expansion Plan 2005 (MTEP 05)
- 2. Provide the title(s) and completion dates of available report(s) regarding the study: N/A
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): http://www.midwestmarket.org/page/Expansion+Planning
- **4. Provide a contact person to obtain project details:** Name, phone, email: Expansion Planning Group (EPG) and the Planning Subcommittee (PS), (651) 632-8400.
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? MTEP05's objective is to ensure future system reliably. MISO has been developing a transmission pricing policy and additions to the planning protocol. These initiatives will help promote the development of system expansion needed to relieve constraints and by providing increased certainty to the cost responsibility and recovery for these expansions.
- **6. Provide a brief summary description characterizing the study:** The MTEP 05 report describes the currently recommended transmission needs for the MISO transmission system. MTEP 05 has identified 615 planned or proposed facility additions or upgrades, mainly for reliability purposes, through 2009. From the results of the Baseline Reliability study, MISO expects to be able to perform in accordance with NERC Planning Standards for normal system conditions, events involving loss of a single transmission facility, and for most events involving loss of more than one facility through 2009. This assessment assumes the implementation of MISO planned projects and that proposed projects or suitable alternatives are in place.
- **7.** What was the geography of the study? The MISO Market consists of parts or all of the following states: Montana, North Dakota, South Dakota, Minnesota, Wisconsin, Iowa, Missouri, Illinois, Indiana, Michigan, Ohio, Kentucky, Pennsylvania, and Virginia.
- **8.** What was the study period? MTEP 05 identifies expansion needed for a planning horizon extending through the peak season of 2009.
- **9.** Describe the study type (such as who initiated the study and why): As an independent system operator (ISO), one of MISO's core functions is to plan for the enhancement and expansion of transmission system capability. MISO considers plans for load growth, generator interconnection requests, transmission and service requests, and MISO analyses of reliability and congestion to prepare its expansion plan.

14

**10.** Characterize the study participants: The Midwest ISO drafts its regional plan by first collaborating with Transmission Owners. Then, the Midwest ISO staff engages in several stages of stakeholder review of the plan. The plan is reviewed first by the Expansion Planning Group (EPG) and then by the Planning Subcommittee (PS). Next, the results are reviewed with the Organization of Midwest States (OMS) and the Advisory Committee before being presented to the Midwest ISO Board of Directors for approval. Once approved by the Board, the regional plan is implemented in accordance with the Transmission Owners agreement.

11. Describe methods (if any) used in studies to measure the magnitudes of the problem addressed: MISO measures the magnitude of problems addressed in the MTEP by examining the future system performance of the contingency studies of the 2009 planning horizon year. MISO identifies constraints using current operational experience, NERC Transmission Loading Reliefs (TLR), reductions in Available Flowgate Capability (AFC), and Firm Transmission Rights (FTR). Each of these operational issues presents a reliability concern unless a generation redispatch is performed as an operating adjustment to the desired dispatch that would otherwise occur. MISO's philosophy is to seek resolution to these reliability issues in the least cost manner, through either a transmission system switching operation, a generation redispatch, or an expansion to the system. MISO reviewed recent incidence of very low AFC, frequent TLR, or constraints to full FTR allocations and has drawn correlations between Planned and Proposed expansion projects and constraints causing low AFC, high incidents of TLR, or pro-rated FTR allocations. MISO notes that many of the binding constraints are associated with TLRs and low AFC values. The expansions in the MTEP 05 address most of the issues identified.

MISO also uses modeling analyses to measure the extent of its constraints. These analyses include the transmission system's steady-state power flow, dynamic system performance, small-signal perturbation simulation, load deliverability assessment, and voltage-stability.

12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? MISO uses NERC and regional reliability and planning standards. The Baseline Study was performed in two phases. Phase 1 of the Baseline Reliability Study determined if the planned projects in the current transmission expansion plan provide adequate system reliability. NERC category A, B, and C events were analyzed with steady-state and dynamic stability analysis. Planning criteria violations (thermal overloads and low or high voltage) were flagged using local limit criteria, as Midwest ISO member's systems have been designed to different standards. Load deliverability was determined for control areas in Midwest ISO by calculation of Loss of Load Probability (LOLP) value. Category C events were evaluated for cascading by using a tripping proxy to gauge the severity of the event and if cascading may occur.

Phase 2 of the Baseline Reliability Study added to the Phase 1 model projects that the Transmission Owners have proposed to meet reliability needs through the period. The critical analyses were repeated to determine if the Planned and Proposed projects in the current transmission expansion plan provide adequate system reliability. When Phase 2 of the Baseline Reliability Study was nearing completion, the RSG's reviewed operational issues associated with transmission service requests (TSR) by examining historical transmission line loading relief

(TLR) requests and future available flowgate capacity (AFC) values. Financial Transmission Rights (FTR) allocation binding constraints were also reviewed. Operational issues that will be addressed by the expansion plan were documented. A voltage stability screening of expected 2009 summer peak conditions was performed to determine areas that may have voltage stability issues and which are being further evaluated in continuing studies.

**13.** Congestion identified: MTEP 05 has identified, through its Baseline Reliability study process, 615 planned or proposed facility additions or enhancements representing an investment of \$2.91 billion through 2009, primarily to maintain reliability.

#### 14. Were non-transmission alternatives compared with transmission alternatives?

The MTEP briefly mentioned that it considers all market perspectives, including demand-side options, generation location, and transmission expansion alternatives. No detail was provided on how there alternatives were considered.

- 15. Were new transmission technologies considered? Not mentioned.
- 16. Describe the most important study assumptions (e.g. fixed hydro dispatch):
  - MISO's baseline study uses MAPP member data from the MAPP 2003 Series model and SPP member data from the most recent SPP Series model.
  - Baseline Reliability study includes planned transmission system upgrade projects in the Baseline models for Phase 1 of the analysis. Previous planning studies have demonstrated the need for these projects;
  - Phase 2 of the analysis includes and any new proposals in the model to address outstanding issues identified in Phase 1.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

#### MISO TRANSMISSION EXPANSION PROJECTS

### SOUTHEASTERN ELECTRIC RELIABILITY COUNCIL (SERC) TRANSMISSION PLANNING SUMMARY

#### PART I: CHARACTERIZATION OF THE STUDY

- **1. Provide the name of the study:** Reliability Review Subcommittee's 2005 Report to the SERC Engineering Committee
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study: Subregional assessments referenced in report. These assessments are summaries primarily based on the FERC Form 715s submitted by the member companies:
- **3.** Provide the details regarding how to obtain any available reports (Web address if available on internet): The SERC form for ordering reports can be found at <a href="http://www.serc1.org/Pages/DocumentDisplay.aspx?FN=SERC/SERC%20Publications/OrderPublications/publication.html">http://www.serc1.org/Pages/DocumentDisplay.aspx?FN=SERC/SERC%20Publications/OrderPublications/publication.html</a>

To receive FERC Form 715s can be obtained only after completing a Critical Energy Infrastructure Information request. Instructions for this request can be found at <a href="http://www.ferc.gov/help/how-to/file-ceii.asp">http://www.ferc.gov/help/how-to/file-ceii.asp</a>

- **4. Provide a contact person to obtain project details: name, phone, email:** Rod Hardiman, SERC Reliability Review Subcommittee, (205) 257-6407
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? The Southeastern Electric Reliability Council (SERC) was created to strengthen the reliability of bulk power supply in the areas served by its member systems. The report provides an opportunity for SERC systems their concerns on current and future matters which may adversely affect the reliability of bulk power systems. The report documents the extent members are keeping other members informed on reliability matters and the coordination of expansion plans in the Region. Studies that have been made to determine the adequacy of interconnections between SERC systems and the contiguous Regions are reported.
- **6. Provide a brief summary description characterizing the study:** The SERC Reliability Review Subcommittee (RRS) uses subregional studies results to assess the reliability of the bulk transmission system. Additionally, the RRS reviews the SERC member data submitted as part of the annual Energy Information Administration's (EIA) Form 411 to determine the adequacy of the Region's planned resources to meet projected demands.
- **7.** What was the geography of the study? The SERC region covers all or part of Virginia, North Carolina, South Carolina, Georgia, Alabama, Louisiana, Mississippi, Tennessee, Kentucky, Arkansas, Missouri, Iowa, Oklahoma, and Florida. Entergy, Southern, TVA, and VACAR represent the major transmission areas covered by the study.
- 8. What was the study period? 2005 to 2014

**9.** Describe the study type (such as who initiated the study and why): SERC began conducting audits of its members in 2002 to examine the processes members use to demonstrate compliance. 2004 represented the end of the first three-year cycle in 2004. The cycle restarted in 2005.

SERC recognizes the need for regional review of reliability matters on a continuing basis. The member systems provide staff to performing system studies for the Region. Joint system studies also are conducted under a number of inter-regional and intra-regional coordination agreements.

- **10.** Characterize the study participants: The Reliability Review Subcommittee (RRS) of the SERC Engineering Committee (EC) annually reviews and assesses the overall reliability (adequacy and security) of the SERC Region bulk electric systems. The review helps ensure that SERC members are meeting the NERC and regional reliability standards. As part of the review, SERC considers both existing and planned projects. The assessments consider a period of at least ten years into the future.
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: The SERC does not have staff performing system studies for the Region; instead, the member systems provide this function. The SERC report indicates that members follow the NERC Reliability Standards for assessing system performance under a variety of conditions. SERC members conduct a variety of independent studies on a continuing basis to assess the reliability of their respective transmission systems. The subregional sections below describe the various types of transmission reliability studies conducted on a periodic basis by the SERC member systems:
  - Entergy conducts short-range and long-range area planning studies to determine the improvements on its transmission facilities. These planning studies are performed annually by the Technical System Planning group. Studies include load-flow, transient stability, and voltage stability studies.
  - Southern subregion members participate in SERC VAST seasonal operating studies that determine the regional transmission system's performance. The studies identify critical facilities that may limit inter-area transfers and establish the interarea transfer limits among VAST system members. Southern also participates in VST system studies which are similar to the VAST system studies except that the study horizon is normally four to five years ahead. The Southern Company and FRCC members also conduct a Joint Planning Study was to determine the Total Transfer Capability between the Southern Control Area and Peninsular Florida for both Southern to Florida and Florida to Southern transfers.
  - TVA performs transmission planning studies on an annual basis to evaluate a tenyear planning horizon. TVA participates in joint studies with neighboring Regions and subregions to assess inter- and intra-regional power transfer capabilities. TVA routinely participates in the MAIN-ECAR-TVA (MET), VACAR-AEP-Southern-TVA-Entergy (VAST), and VACAR-Southern-TVA-Entergy (VST) studies. Internally, TVA also conducts daily, weekly, and monthly operational planning studies (current day to 13 months) on a routine schedule to assess specific transmission outage requests and calculate Total Transfer Capabilities (TTC). Special

studies are performed on an as needed basis to address specific transmission system reliability concerns.

12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? Screening studies are used to find areas that have a potential risk for voltage collapse. A typical criterion is that the MW load of the system must be at least 5% below the collapse point, or the nose, of the P-V (voltage versus load) curve. The P-V curve graphs voltage versus load. An overly optimistic calculation of security margin is obtained when P-V curve analysis is used for a system with no contingencies.

Other screenings using V-Q curves (voltage versus reactive power) are also used to identify areas that have a low voltage stability margin. In this method the voltage stability margin is calculated by the distance to the minimum point on the V-Q curve and is measured in terms of MVARs.

Members also conduct stability studies to support the NERC Reliability Standards must consider different categories of disturbance severity.

- 13. Congestion identified: Entergy lists 26 projects that are slated between the 2005 and 2014 time frame required to relieve congestion for current and projected areas of constraint. Alabama power lists 3; Dominion Virginia Power lists 5; Georgia Power lists 17; Georgia Transmission lists 20; Mississippi Power lists 2; Municipal Electric Authority of Georgia lists 2; Progress Energy lists 3; Savannah Electric and Power list 1; South Carolina Public Service Authority lists 5; South Mississippi Power Association lists 6; and Tennessee Valley Authority lists 2. The list of congestion specifying congestion elements is deemed Critical Energy Infrastructure Information and cannot be accessed without SERC's consent.
- 14. Were non-transmission alternatives compared with transmission alternatives? No.
- 15. Were new transmission technologies considered? None mentioned.
- **16.** Describe the most important study assumptions (e.g. fixed hydro dispatch): Specific study assumptions were not provided.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

### TENNESSEE VALLEY AUTHORITY (TVA) ANNUAL TRANSMISSION PLANNING AND EVALUATION REPORT 2004

#### PART I: CHARACTERIZATION OF THE STUDY

- **1. Provide the name of the study:** Tennessee Valley Authority (TVA) Annual Transmission Planning and Evaluation Report 2004
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study:  $N\!/\!A$
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): This document is a FERC Form 715. FERC Form 715s can be obtained only after completing a Critical Energy Infrastructure Information request. Instructions for this request can be found at <a href="http://www.ferc.gov/help/how-to/file-ceii.asp">http://www.ferc.gov/help/how-to/file-ceii.asp</a>
- **4. Provide a contact person to obtain project details: name, phone, email:** James T. Whitehead Manager, Transmission Planning Department; (423) 751-3913; jtwhitehead@tva.gov
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? FERC Form 715s are requirements by the FERC. They are intended for a firm, utility, RTO, or ISO to assess the reliability of its transmission system.
- 6. Provide a brief summary description characterizing the study:
- **7.** What was the geography of the study? The TVA region includes Tennessee and parts of Mississippi, Alabama, Georgia, North Carolina, Virginia, and Kentucky.
- **8.** What was the study period? Study examines peak summer and winter conditions and offpeak spring and fall loading for the next 10 years.
- **9. Describe the study type (such as who initiated the study and why):** TVA performs power flow, stability, and fault analyses of the TVA network
- 10. Characterize the study participants: TVA Transmission Planning Department
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: TVA's uses power flow, stability, and fault analyses to analyze the TVA network.
- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? TVA is a member of the North American Electric Reliability Council (NERC) and SERC. TVA's planning practices incorporate the concepts of the NERC Planning Standards

and SERC supplements to the Standards. These NERC Standards and SERC supplements are available from the NERC and SERC offices, respectively.

- **13.** Congestion identified: Not available for CEII reasons.
- 14. Were non-transmission alternatives compared with transmission alternatives? No.
- 15. Were new transmission technologies considered? Not mentioned.
- **16.** Describe the most important study assumptions (e.g. fixed hydro dispatch): Specific study assumptions were not provided.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

### ENTERGY ANNUAL TRANSMISSION PLANNING AND EVALUATION REPORT 2004

PART I: CHARACTERIZATION OF THE STUDY

- 1. Provide the name of the study: Entergy Annual Transmission Planning and Evaluation Report 2004
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study:  $N\!/\!A$
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): This document is a FERC Form 715. FERC Form 715s can be obtained only after completing a Critical Energy Infrastructure Information request. Instructions for this request can be found at <a href="http://www.ferc.gov/help/how-to/file-ceii.asp">http://www.ferc.gov/help/how-to/file-ceii.asp</a>
- 4. Provide a contact person to obtain project details: name, phone, email:

Kham Vongkhamchanh Supervisor, Transmission Planning (Technical System Planning) 639 Loyola Avenue L-MOB-18C New Orleans, LA 70113 (504) 310-5812 / kvongkh@entergy.com

- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? FERC Form 715s are requirements by the FERC. They are intended for a firm, utility, RTO, or ISO to assess the reliability of its transmission system.
- 6. Provide a brief summary description characterizing the study:
- **7. What was the geography of the study?** The Entergy region includes parts or all of Arkansas, Louisiana, Texas, and Mississippi.
- **8. What was the study period?** The study examines peak summer, fall, and spring conditions and winter conditions through 2013
- **9.** Describe the study type (such as who initiated the study and why): The study defines areas of constraint based on power flow, thermal, and voltage stability analyses.
- 10. Characterize the study participants: Entergy Transmission Planning Group
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: Entergy uses thermal electric systems, voltage, and stability limits to analyze the Entergy network.

- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? Entergy is a member of the North American Electric Reliability Council (NERC) Planning Standards, and Southeastern Reliability Council (SERC). Entergy's planning practices therefore incorporate the concepts of the NERC Planning Standards and SERC supplements to the Standards. These NERC Standards and SERC supplements are available from the NERC and SERC websites, respectively.
- **13.** Congestion identified: Not available for CEII reasons.
- 14. Were non-transmission alternatives compared with transmission alternatives? No
- 15. Were new transmission technologies considered? Yes
- **16.** Describe the most important study assumptions (e.g. fixed hydro dispatch): Specific study assumptions were not provided

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

#### SOUTHWEST POWER POOL (SPP) EXPANSION PLAN 2005 - 2010

PART I: CHARACTERIZATION OF THE STUDY

- **1. Provide the name of the study:** Southwest Power Pool (SPP) Expansion Plan 2005 2010, September 14, 2005
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study:  $\ensuremath{\mathrm{N/A}}$
- 3. Provide the details regarding how to obtain any available reports (Web address if available on internet): <a href="http://www.spp.org/Doc Results.asp?Group">http://www.spp.org/Doc Results.asp?Group</a> id=527
- **4. Provide a contact person to obtain project details: name, phone, email:** Ronnie Frizell, Chairman of the Transmission Working Group, (501) 570-2433,
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? The SPP RTO Expansion Plan is divided into two phases. Phase I of the SPP RTO Expansion Plan focuses on reliability needs, and Phase II weighs market needs related to an economic expansion plan. Study results are being coordinated with other entities responsible for transmission needs assessment and planning.

Phase 1 is intended to provide an independent assessment of expansion plans required by SPP in order to meet NERC, regional and local planning standards. The study will review the summer peak conditions for 2005 through 2010. Major projects recommended through the reliability assessment are also being evaluated for 2013 summer peak conditions to verify the long-term effectiveness of these projects.

Phase II of the SPP RTO Expansion Plan addressed potential transmission projects that may be justified based on the expected economic benefits. The market assessment is intended to provide an independent market evaluation of potential transmission expansion projects that offer the greatest return on investment. The goal of Phase II is to have transmission installed that will economically alleviate congestion. SPP measures its potential projects by determining whether the savings from reduced congestion exceed the costs of transmission upgrades.

- **6. Provide a brief summary description characterizing the study:** Phase I addresses reliability violations and recommends projects to meet planning standards. A market assessment was conducted during Phase II to determine potential projects for system reinforcement. Potential projects were identified from a variety of resources including stakeholder feedback, review of past transmission line loading relief, refused long-term transmission reservations and suggestions from summit participants. Thirty three projects were screened. The top four with the best cost to benefit ratio were considered. These projects were further studied by doing complete seasonal economic runs for 2005 and 2010.
- **7. What was the geography of the study?** The SPP region includes part or all of New Mexico, Texas, Oklahoma, Kansas, Missouri, Arkansas, and Louisiana.

#### 8. What was the study period? 2005 to 2010

**9. Describe the study type (such as who initiated the study and why):** SPP has been involved in regional planning for decades. SPP as an RTO is responsible for planning and for directing or arranging necessary transmission expansions, additions and upgrades that will enable it to provide efficient, reliable and non-discriminatory transmission service. SPP began the initial RTO expansion planning process in late 2003. The SPP RTO expansion planning process is open and collaborative using regional planning summits to present the process, discuss results, and collect feedback. A variety of parties attend the regional planning summits – regulators, SPP transmission owners, transmission owners from other regions, members of the Wind Coalition, load serving entities, consulting firms and independent system operators.

The SPP Transmission Working Group (TWG) has designed a formal process for planning and expansion for market solutions to relieve congestion. SPP works with state regulatory agencies and legislators and coordinates with programs of existing regional transmission groups to ensure that the regional planning process addresses all needs.

**10.** Characterize the study participants: The Transmission Working Group (TWG) has been assigned primary responsibility for the regional planning process. The TWG consists of both transmission owning and non-transmission owning members. SPP stakeholders are encouraged to actively participate in the regional planning process to ensure that the recommended expansion plans are the best solutions in and around the SPP footprint.

### 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed:

#### Phase 1

Contingency analyses were performed for facilities above 100 kV, all generators in SPP, Associated Electric Cooperative, Inc. (AECI) and Entergy. Contingency analyses were also performed for facilities above 230 kV in SPP's first tier control areas as well as other first tier companies. Modeled facilities 69 kV and above were monitored for overloads and voltage violations in SPP. SPP monitored Entergy and AECI facilities above 100 kV plus other first-tier companies with 230 kV and above.

SPP solicited input from stakeholders and transmission owners to list potential stability simulations. Stability analyses were performed on the more severe Categories C and D outages. Knowing that stability analysis requires a great deal of time and resources, SPP staff requested the help of SPP stakeholders at TWG meetings to prioritize the list of stability simulations.

A basic three-phase fault study was performed on locations where system improvements were proposed. Results were shared with transmission owners to determine whether further fault studies are required. It is important to note that breaker replacements, due to an increase in fault currents, have not been included in the final list of SPP expansion projects.

#### Phase II

The projects include proposed and exploratory transmission projects provided by transmission owners and not used in Phase I, projects proposed by stakeholders, projects from breakout groups at the Planning Summit III, projects developed after reviewing transmission line loading relief history and projects after reviewing rejected transmission service. Thirty-three projects were included in the screening process.

The steps for the screening process include:

- 1) Rank the list of potential transmission projects
- 2) Used a typical week from July 2005 to run ProSym
- 3) Base MarketSym run made for 2005 with the OPF area including SPP and first tier companies
- 4) Change case created for each project on the list of potential transmission projects
- 5) MarketSym run made for each change case
- 6) Comparing the base case to the change case, the total dispatch savings (dispatch cost plus violation cost) extracted
- 7) 10-year savings estimated by calculating the savings over the summer period and assuming the yearly savings is twice the summer savings
- 8) Present worth of the future savings over a 10-year period calculated using an eight percent discount rate
- 9) Estimated cost developed for each project
- 10) Ratio number calculated by dividing the estimated dispatch savings by the cost of the project
- 11) Projects ranked by the ratio (Note: the ranking method used was solely for screening purposes)
- 12) List of projects presented in an open SPP TWG meeting for comments (List of screened projects can be found in Appendix C)

Based on project ranking, SPP staff recommended the top four that yielded the highest costbenefit ratio, which are listed below in response to question 13.

# 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)?

#### Contingency Simulations

Transmission facilities in the SPP footprint along with first tier companies were tested using NERC Table 1A guidelines, SPP reliability criteria, and transmission owner reliability criteria. If a transmission owner has more restrictive criteria than the SPP or NERC criteria, SPP will perform the analysis using the transmission owner's criteria.

#### 13. Congestion identified:

The top four projects are as follows:

- Tulsa East Switching Station
- Sooner-Cleveland 345 kV line
- Rose Hill-Sooner 345 kV line
- Tolk-Potter 345 kV line

Detailed analysis of the four projects showed that the projects each have approximately 10-year return on investment. The Sooner-Cleveland 345 kV line had the best cost to benefit ratio. Summit participants showed interest in all four projects. A proposed economic upgrade process was presented at the Regional Planning Summit IV.

- 14. Were non-transmission alternatives compared with transmission alternatives? No.
- 15. Were new transmission technologies considered? Not mentioned.

#### 16. Describe the most important study assumptions (e.g. fixed hydro dispatch):

The report did not state any assumptions for Phase I analysis.

For the Phase II economic modeling analysis, SERC used the following assumptions in the Global Energy MarketSym package, which utilizes the PowerWorld load flow program:

- SPP region is modeled as 19 transmission areas encompassing the 17 tariff control areas
- Public Service Company of Oklahoma (PSO) and Southwestern Electric Power Company (SOEP) are dispatched as a single control area (AEPW)
- Oklahoma Municipal Power Authority (OMPA) loads are distributed within Oklahoma Gas and Electric (OGE), PSO/AEPW and Western Farmers Electric Coop (WFEC) transmission areas
- Arkansas Electric Cooperative Corporation loads are aggregated with other loads at buses within Entergy, SOEP and SWPA systems
- A portion of Grand River Dam Authority (GRDA) loads are embedded in the Associated Electric Cooperative, Incorporated (AECI) system
- Simulation of every other hour in a typical week to represent a month
- Control area peak load forecast based on SPP Energy Information Administration (EIA) 411 report and other information analyzed and documented by Henwood staff
- Peak loads are modeled based on total internal demand as reported by utilities
- Hourly load shapes are based on 'typical year' representation derived by Henwood from multiple years of historical data

- Interruptible loads reported in EIA 411 are modeled as dispatchable resources in ProSym
- More than 95% of total generation capacity of the optimal power flow (OPF) area is explicitly identified and mapped
- Thermal generator forced outage rates and equivalent schedule outage rates are estimated for classes of generators from NERC Generating Availability Data System (GADS) data reported through the year 1999
- The ProSym 'Converged Monte-Carlo' technique is used for forced outage rate
- Natural gas price estimates are generally tied to Henry Hub price
- Fuel oil prices are generally tied to NYMEX future prices
- Unit commitment/dispatch by ProSym
- Unit commitment by control area
- Spinning reserve requirement 2% of load
- Regulation and load following 3% of load
- Non-spinning requirement 2% of load
- Must-run units modeled in SPS
- Additional must-run units will be modeled as information becomes available
- AC optimal power flow (AC is used to incorporate losses and VAR flows)
- Calculates nodal prices
- Monitor branches > 100 kV
- Monitor all flowgates > 100%
- Flowgate operating range for violation cost 0-2% (Penalty of \$45 per MW per hour)
- Flowgate operating range for violation cost > 2% (Penalty of \$90 per MW per hour)
- Branches or transformers above normal rated capacity (Penalty of \$30 per MW per hour)
- Hurdle rates
  - o Between SPP areas \$2
  - o Between SPP and First Tier \$5
- \$4 added to offer curves for independent power producers

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

SPP Transmission Expansion Projects

#### INTERREGIONAL STUDIES

#### PART I: CHARACTERIZATION OF THE STUDY

#### 1. Provide the name of the study:

- MAAC-ECAR-NPCC MEN Interregional Transmission System Reliability Assessment: Summer 2005
- MEN Interregional Transmission System Reliability Assessment: Winter 2005/06
- VACAR-ECAR-MAAC (VEM) Interregional Transmission System Reliability Assessment: Summer 2005
- VEM Interregional Transmission System Reliability Assessment: Winter 2005/06
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study: N/A
- **3.** Provide the details regarding how to obtain any available reports (Web address if available on internet): These documents are considered Critical Energy Infrastructure Information. They may be obtained only after receiving permission from Reliability First.
- 4. Provide a contact person to obtain project details: name, phone, email: <a href="http://www.rfirst.org">http://www.rfirst.org</a>.
- **5.** What was the purpose of the study (e.g., what problem was the study intended to address)? The studies examine First Contingency Incremental Transfer Capability (FCITC) and First Contingency Total Transfer Capability (FCTTC) for selected transfers that may occur simultaneously among, or through, the regions. In addition, the studies provide a transmission appraisal of the member regions.
- **6. Provide a brief summary description characterizing the study:** The studies' objective is to identify corridors of the Bulk Power System where limits may be present for wide-area transfers under emergency and non-emergency conditions.
- 7. What was the geography of the study?
  - MEN: The borders of MAAC (Pennsylvania, New Jersey, Maryland, Delaware), ECAR (Indiana, Ohio, Kentucky, West Virginia, Michigan, Pennsylvania), and NPCC (Ontario, Quebec, New York, Vermont, New Hampshire, Maine, Nova Scotia, Prince Edward Island Massachusetts, Rhode Island, Connecticut)
  - VEM: The borders of VACAR (Virginia, North Carolina, South Carolina), ECAR (Indiana, Ohio, Kentucky, West Virginia, Michigan, Pennsylvania), and MAAC (Pennsylvania, New Jersey, Maryland, Delaware).

#### 8. What was the study period?

- Summer 2005
- Winter 2005/2006

- **9.** Describe the study type (such as who initiated the study and why): Theses studies were created for reliability reasons to examine transfer limits between regions.
- **10.** Characterize the study participants: Members of the transmission working groups for each region
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: Studies performed power flow, thermal analysis, and voltage stability.
- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? NERC and regional reliability standards are used for defining areas of congestion.
- 13. Congestion identified: Not available for CEII reasons.
- 14. Were non-transmission alternatives compared with transmission alternatives? No.
- 15. Were new transmission technologies considered? No.
- **16.** Describe the most important study assumptions (e.g. fixed hydro dispatch): Assumes all transmission facilities are in service and all operational procedures are used when analyzing single element contingencies.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

### ECAR AND MAIN SUMMER 2005 AND WINTER 2005/2006 ASSESSMENTS

#### PART I: CHARACTERIZATION OF THE STUDY

#### 1. Provide the name of the study:

- East Central Area Reliability (ECAR) Council 2005 Summer Assessment of Transmission System Performance
- ECAR 2005/06 Winter Assessment of Transmission System Performance
- Mid-America Interconnected Network (MAIN) 2005 Summer Assessment of Transmission System Performance
- ECAR 2005/06 Winter Assessment of Transmission System Performance
- 2. Provide the title(s) and the completion dates of available report(s) regarding the study:  $N\!/\!A$
- **3.** Provide the details regarding how to obtain any available reports (Web address if available on internet): As of January 1, 2006, ECAR and MAIN are part of Reliability First. These documents are considered Critical Energy Infrastructure Information. They may be obtained only after receiving permission from Reliability First.
- 4. Provide a contact person to obtain project details name, phone, email: <a href="http://www.rfirst.org">http://www.rfirst.org</a>.
- 5. What was the purpose of the study (e.g., what problem was the study intended to address)? These semiannually studies assess their respective bulk transmission systems. The assessments provide insight into the expected performance of the bulk transmission system and identify potential transmission constraints under a wide range of system conditions for the upcoming peak load season.

Note: The MAIN studies also provide interregional appraisals for MAIN-ECAR-TVA, MAIN-MRO-SPP, and MAIN-SERC WEST. The purposes of these interregional studies are similar in nature to the VEM and MEN studies discussed previously.

- **6. Provide a brief summary description characterizing the study:** The studies define areas of constraint based on power flow, thermal, and voltage stability analyses.
- 7. What was the geography of the study?
  - ECAR Indiana, Ohio, Kentucky, West Virginia, Michigan, and Western Pennsylvania
  - MAIN: Wisconsin, Illinois, Iowa, Minnesota, and Missouri

- 8. What was the study period?
  - Summer 2005
  - Winter 2005/2006
- **9.** Describe the study type (such as who initiated the study and why): The reports are designed to provide Reliability Coordinators, Transmission Operators, and Transmission Planners with an indication of where transmission constraints are anticipated for the upcoming peak load season.
- **10.** Characterize the study participants: ECAR and MAIN Transmission System Performance Working Groups (TSPWG)
- 11. Describe methods (if any) used in studies to measure the magnitude of the problem addressed: Studies performed power flow, thermal analysis, and voltage stability.
- 12. What criteria and metrics did the study use when defining congestion and a solution (Indicate the metric used for measuring congestion, e.g. hourly LMP or annual production cost savings)? NERC and regional reliability standards are used for defining areas of congestion.
- **13.** Congestion identified: Not available for CEII reasons.
- 14. Were non-transmission alternatives compared with transmission alternatives? No.
- 15. Were new transmission technologies considered? No.
- 16. Describe the most important study assumptions (e.g. fixed hydro dispatch): None mentioned.

#### PART II: CHARACTERIZATION OF PROPOSED PROJECTS

Project list considered Critical Energy Infrastructure Information (CEII).

## Task 2





DOE Congestion Study: Task 2
March 15, 2006
Revised April 28, 2006
Second Revision July 12, 2006

### **Task 2 Project Team**

#### **CRA International**

- Alex Rudkevich
- Kaan Egilmez
- Minghai Liu
- Prashant Murti
- Bruce Tsuchida
- Poonsaeng Visudhiphan

### **University of Illinois at Urbana Champaign**

Professor Thomas J. Overbye



### **Outline**

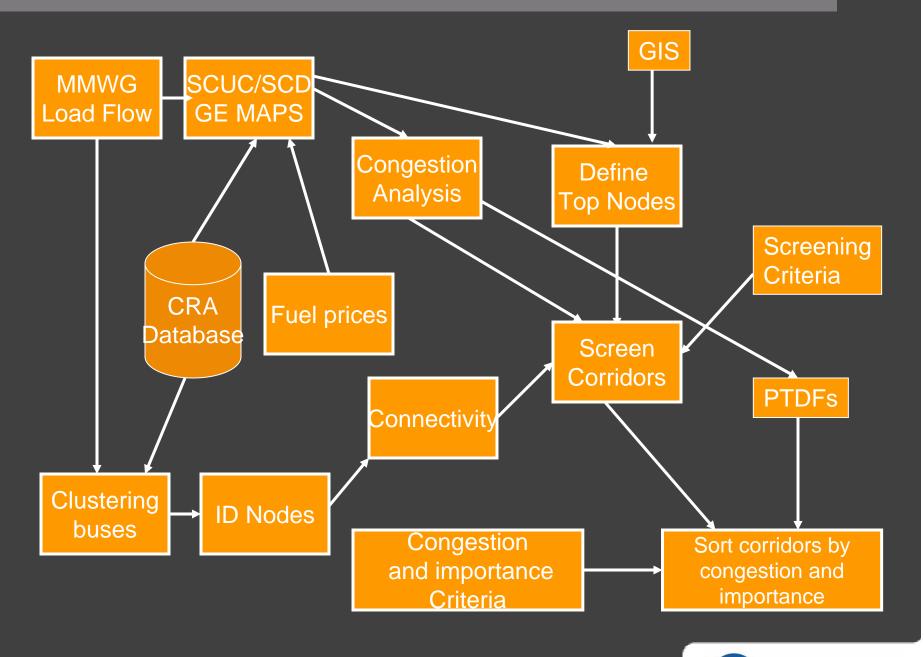
- Objectives of Task 2
- Analytical Steps
- Scenarios
- Step 1. Hourly simulations of Eastern Interconnection using GE MAPS
  - Key Assumptions and Data Sources
  - Findings
- Step 2. Defining key end markets for corridors
  - Clustering analysis and results
  - Simulation results for major Nodes
- Step 3. Defining corridors
  - Connectivity
  - Pairing source Nodes with sink nodes
  - Flowgates and corridors
- Step 4. Analysis of congestion of corridors



### Task 2 Objectives

- Conduct a detailed simulation analysis of the Eastern Interconnection with the primary focus on the performance of the transmission system
- Identify major points of transmission congestion
- Develop a practical definition for modeling purposes of a transmission corridor and use it to identify major corridors within Eastern Interconnection
- Develop quantitative indicators of congestion and relative importance of major corridors and compute these indicators for identified corridors





### **Analytical Steps**

- Step 1 conduct an 8760-hour simulation of Eastern Interconnection using GE MAPS. Perform congestion analysis of transmission constraints/flowgates using simulation results
- Step 2 define key end markets (nodes) for corridors, apply simulation results to nodes and compute major indicators for nodes
- Step 3 define corridors as pairs of connected nodes, screen for corridors of interest
- Step 4 Use PTDFs and GE MAPS results to establish a relationship between flowgates and corridors; measure corridor congestion; sort corridors by congestion and importance indicators

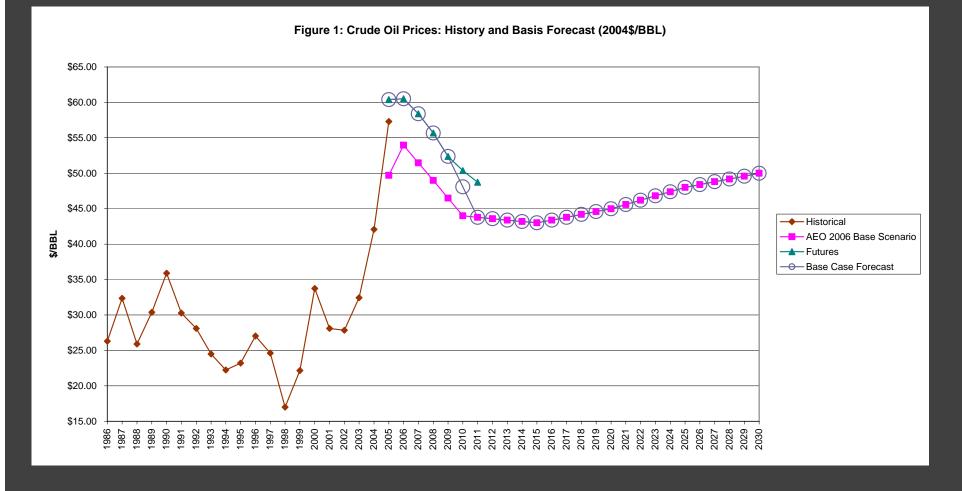


#### **Scenarios**

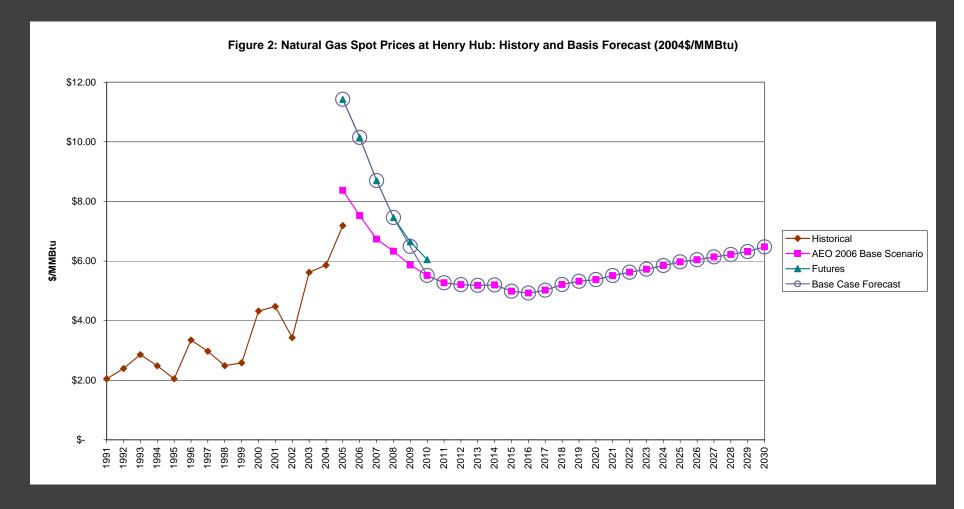
- CRA performed congestion analysis of Eastern Interconnection for two study years: 2008 and 2011 with major emphasis placed on year 2008. Analysis for 2011 is rather indicative due to substantial uncertainty in future developments of the Eastern Interconnection system
- For each year, CRA performed simulations under three fuel scenarios:
  - Base Case Scenario
  - High Fuel Price Scenario
  - Low Fuel Price Scenario
- The key objective in considering alternative fuel scenarios is to assess the impact of fuel price on absolute and relative changes of congestion in various parts of the Eastern Interconnection
- Details of fuel price scenarios are provided in Appendix 7



### **Crude Oil Price Forecast: Base Case**

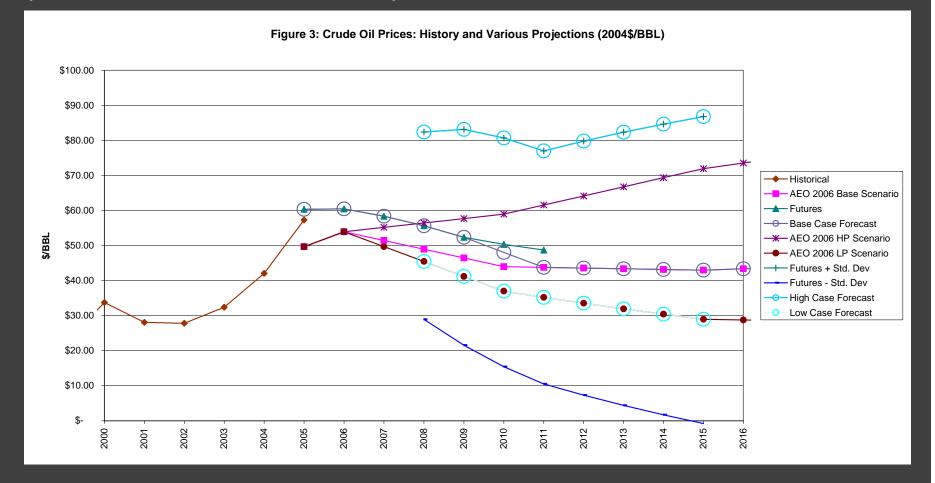


### **Natural Gas Price Forecast: Base Case**



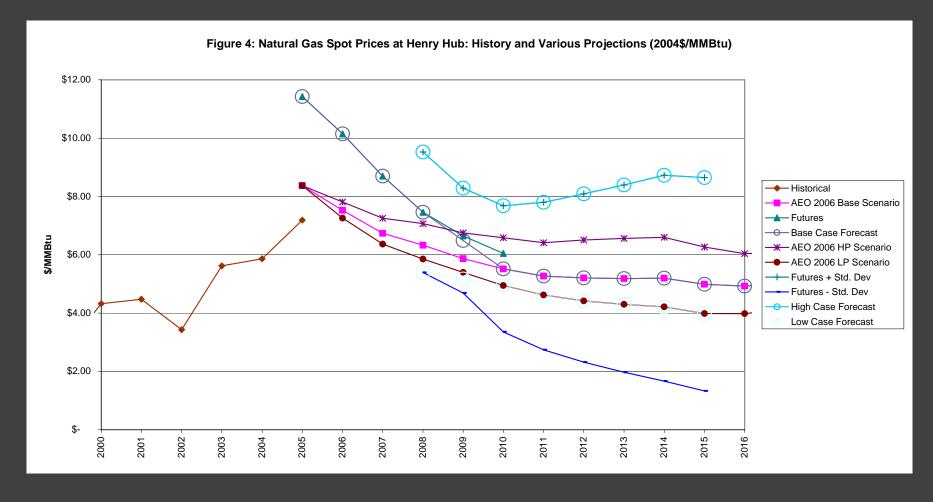


### **Crude Oil Forecast Scenarios**





### Natural Gas Price Forecast Scenarios









# Step 1. 8760 Simulations of Eastern Interconnection using GE MAPS: Data Sources and Assumptions

#### Load data:

- For each load serving entity GE MAPS requires an hourly load shape and an annual forecast of peak load and total energy.
- Loads for forecast years are scaled based on these parameters. Load shapes are drawn from hourly actual demand for 2002, as published in FERC Form 714 submissions and on the websites of various Independent System Operators (ISOs) and NERC reliability regions.
- Peak load and annual energy forecasts are taken from the most recent data available in FERC Form 714 submissions (2004) and from forecast reports published by ISOs and NERC regions (2005)

#### Generator data:

 The CRA generation database reflects unit-specific data for each generating unit based on a wide variety of sources. In cases where unit-specific data is not available, representative values based on unit type, fuel, and size are used.

#### Capacity additions and retirements

In the 2008 simulation, CRA adds new generation based on projects in development or advanced stages of permitting, as indicated by trade press announcements, trade publications, environmental permit applications, and internal knowledge.
 CRA also adds generic capacity as required to maintain resource adequacy per installed capacity reserve margins published by various ISOs and NERC regions. Most additions were made for the 2011 scenario.

#### • Environmental Regulations

CRA models NOx and SO2 emission rates for all units where such data is available. In addition, CRA models compliance with various allowance trading programs, and attempts to capture the effect of future environmental regulations. All existing plant emission rates are drawn from the Emissions Scorecard published by the US Environmental Protection Agency. Emission rates for NOx and SO2 are obtained from industry futures, in particular those published by the Cantor Environmental Brokerage. In this analysis CRA uses allowance trading prices based on futures for the 2008 simulations. For the 2011 simulations, CRA uses the allowance price forecast applied by the Energy Information Administration in developing the 2006 Annual Energy Outlook.

#### Marginal Cost Based Pricing

 All generation units are assumed to bid marginal cost (opportunity cost of fuel plus non-fuel VOM plus opportunity cost of tradable permits). It is reasonable to assume that the real markets are not perfectly competitive and thus the model tends to underestimate the prices in the real markets.

#### • Refer to Appendix 6 for details on data sources and input assumptions



### **Transmission System Representation**

- The CRA model is based on load flow cases provided by the NERC Multiregional Modeling Working Group (MMWG). This analysis uses the MMWG 2005 series load flow cases for the summer of 2007 and the summer of 2010. The Cross-Sound and Neptune high voltage DC cables are added to these cases. Apart from these DC cables, no transmission upgrades are added apart from those included in the MMWG cases
- CRA explicitly modeled the US portion of Eastern Interconnection and Ontario. Flows across boundaries with other Canadian markets were modeled using historical data
- Monitored constraints originate in the following sources:
  - The NERC flowgate book.
  - The list of flowgates published by the Midwest ISO on their website.
  - A list of flowgates provided by the Southwest Power Pool.
  - FERC Form 715 filings, seasonal transmission assessment reports, and studies published by NERC regions and Independent System Operators.
  - Regional Transmission Expansion Plan (RTEP) reports published by various ISOs.
  - The 2004 Intermediate Area Transmission Review published by the New York ISO.
  - The CP-10 Working Group report (2004) by the Northeast Power Coordinating Council.
  - Contingency analyses performed by General Electric and by CRA.
  - Historically binding constraints monitored by CRA.



#### **Monitored constraints**

- GE MAPS has a limit of up to 5000 constraints it can monitor for
- The initial set of constraints CRA collected for the analysis from various sources was well in excess of that limit
- First, redundant constraints were eliminated
- Next, CRA performed a series of simulations with full representation of constraints on one part of the system and partial representation of constraints in other parts of the system to identify constraints that were least likely to bind and therefore could be eliminated from the analysis
- Monitored constraints included known interfaces, single monitored lines as well as numerous contingency constraints
- Monitored limits were based on thermal or voltage or stability considerations
- Limits for thermal constraints were set based on thermal ratings identified in the MMWG load flow case for monitored lines
- Voltage or stability limits were obtained from planning and operational studies where available



### Indicators of Congestion Applied to Flowgates

- Binding Hours: Number of hours (or % of time annually) the flowgate was binding
- U90: Number of hours (or % of time annually) the flowgate was loaded in excess of 90% of its limit
- All-hours shadow price: average shadow price over all hours in a year
- Binding hours shadow price: average shadow price over hours during which the flowgate was binding
- Congestion rent: shadow price times flow times number of hours the flowgate is binding

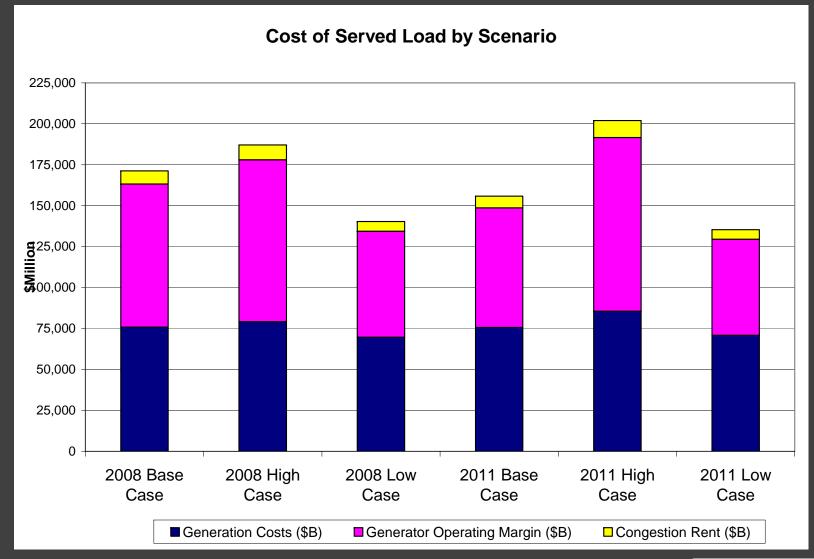


### Cost of Served Load and Congestion Rent

- We define the wholesale cost of served load as the total amount loads pay for power (wholesale price times energy adjusted for transmission losses)
- If wholesale prices in the system are defined as locational marginal prices, then
  - In absence of transmission congestion, cost of served load is equal to payments due to generators
  - When transmission system is congested, the cost of served load (based on prices at load locations) always exceeds the payment due to generators (based on prices at generator locations)
- System-wide congestion rent represents the difference between the cost of served load and payments due to generators for energy they inject
- On the other hand, this system-wide congestion rent is equal to the sum of congestion rent of all individual constraints computed as the product of the shadow price times the flow on each constraint
- As graphically shown on the next slide, cost of served load could always be presented as a sum of three components:
  - Variable generation cost
  - Generator operating margin (payments to generators less variable generation costs)
  - Congestion rent



# Congestion Rent in the Context of Total Cost of Served Load (includes US portion of Eastern Interconnection and Ontario)





# **Summary of Simulation Results (US portion of Eastern Interconnection and Ontario)**

						ı		
	2008 Base Case	2008 High Case	2008 Low Case	2011 Base Case	2011 High Case	2011 Low Case		
Generation Costs (\$B)	75,888	79,189	69,663	75,681	85,640	70,883		
Generator Operating Margin (\$B)	87,347	98,830	64,778	73,069	106,013	58,648		
Congestion Rent (\$B)	8,090	9,064	5,924	7,044	10,311	5,809		
Total generation (TWh)	3,224	3,223	3,225	3,381	3,378	3,378		
Installed summer capacity (GW)		737			759			
Total non-coincident peak (GW)		632		667				

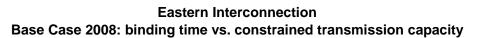


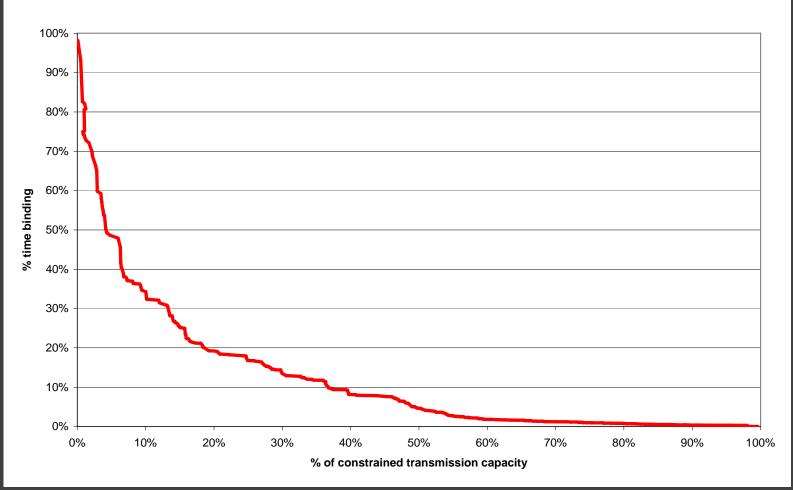
### Several observations regarding Base Case results

- 10% of constrained flowgate capacity binds more than 3000 (35% of the time) hours a year
- 10% of constrained flowgate capacity operates above 90% of the limit for over 4900 (57% of the time) hours
- 46% of constrained flowgate capacity experience all-hours average shadow prices above \$1.00/MWh;
- 10% show all-hours congestion prices above \$10/MWh
- 20% of constrained flowgate capacity account for 60% of congestion rent
- 42% of constrained flowgate capacity account for 90% of congestion rent



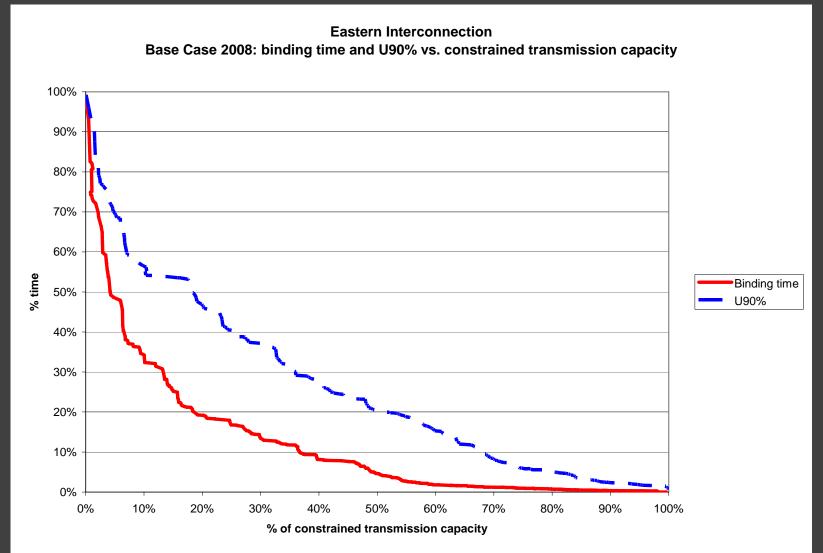
### Flowgates: Distribution of Binding Hours





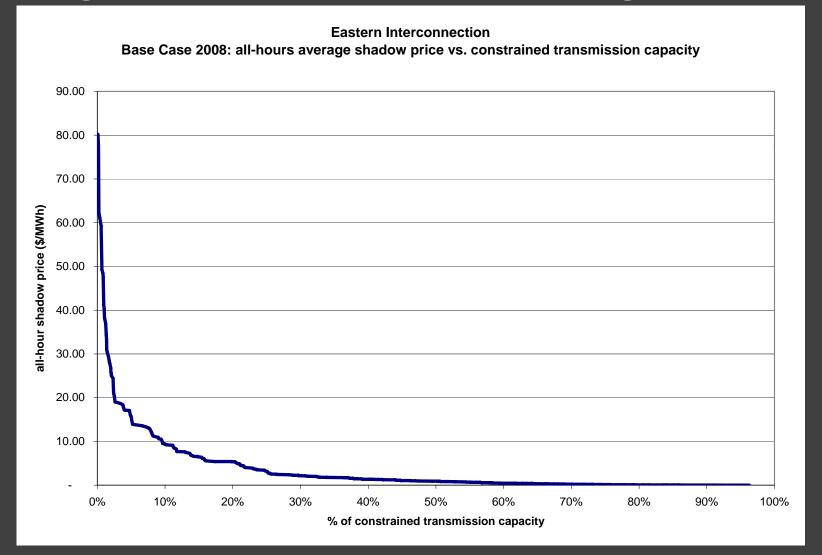


### Flowgates: Distribution of Binding Hours and U90



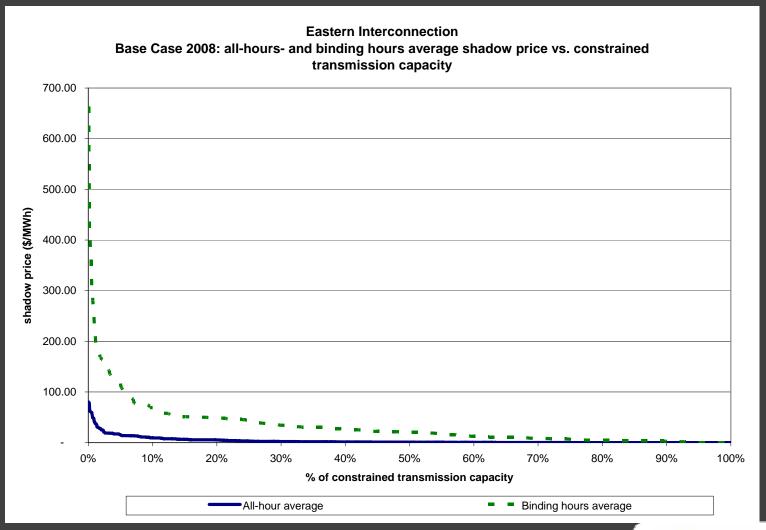


### Flowgates: Distribution of All-hours Congestion Price



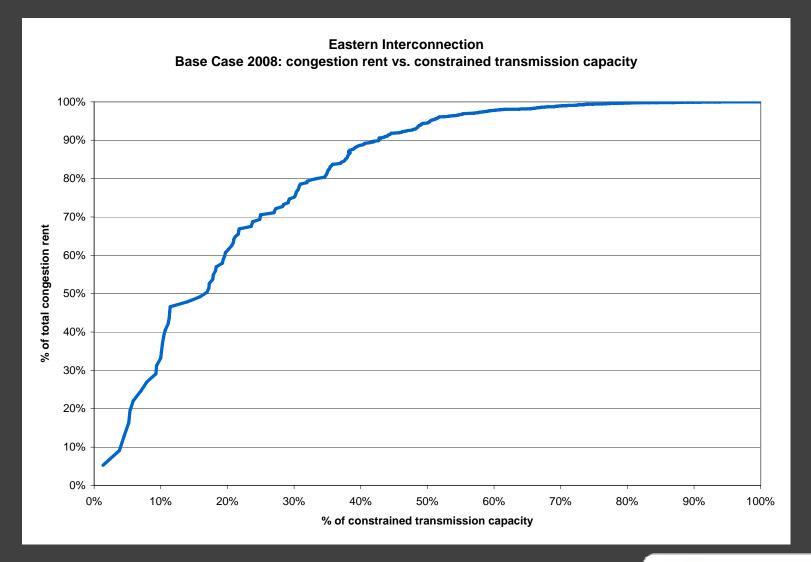


# Flowgates: All-hours and Binding Hours Congestion Price



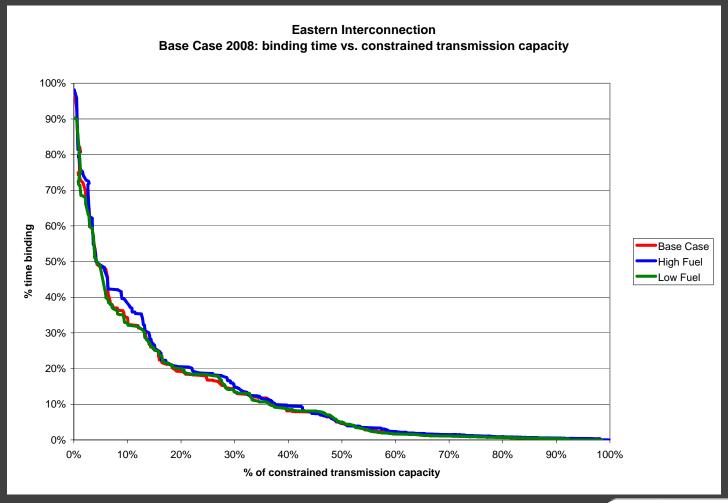


### Flowgates: Cumulative Distribution of Congestion Rent



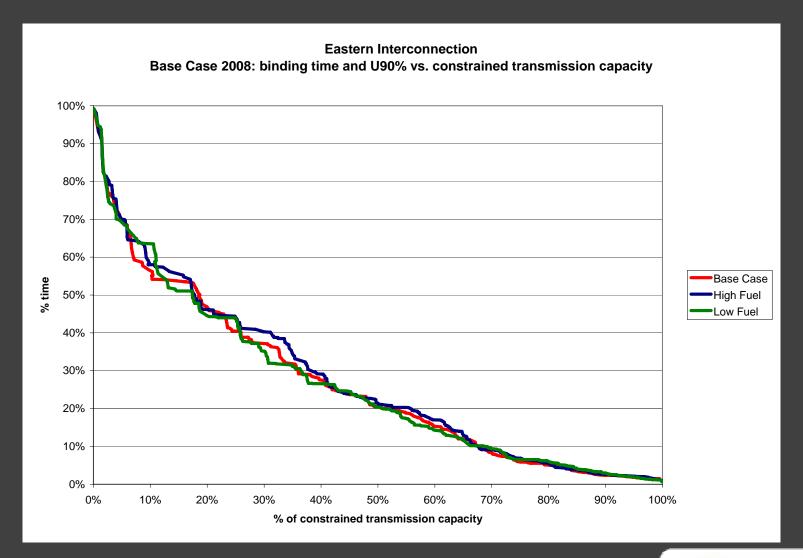


# For constraints that bind over 10% of the time distribution of binding time appears sensitive to fuel prices



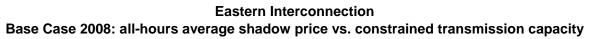


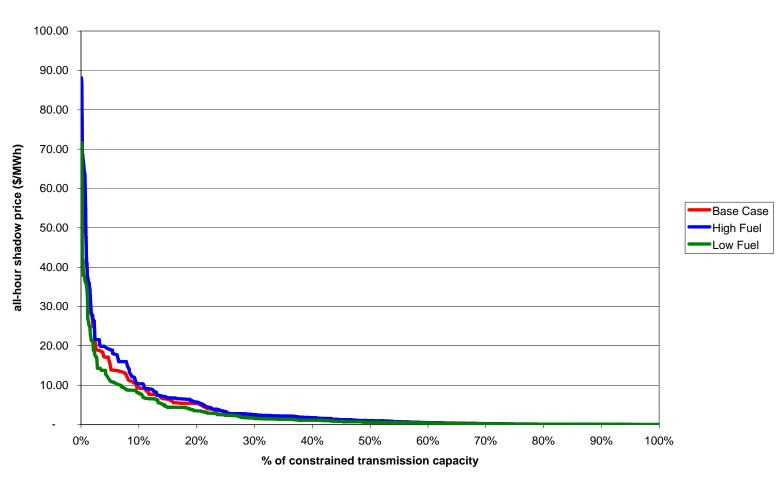
### For constraints with U90 over 25% distribution of U90 is quite sensitive to fuel prices





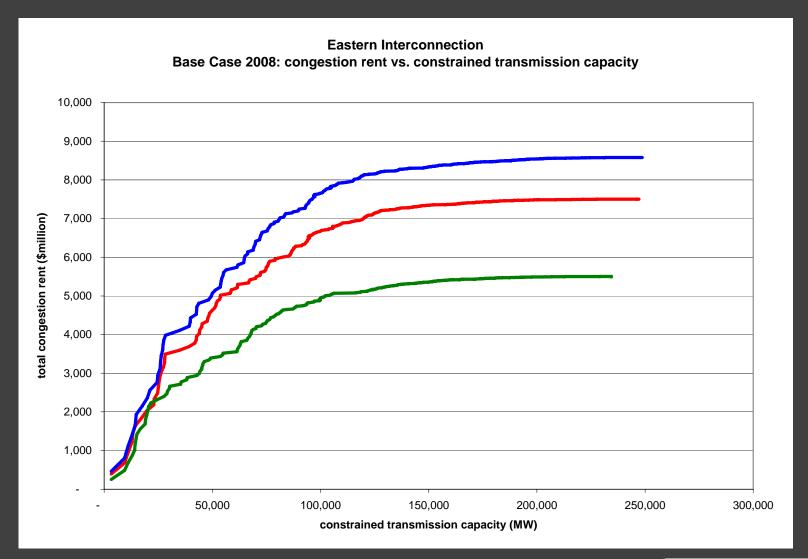
### Shadow prices are very sensitive to fuel prices







### Congestion rent is very sensitive to fuel prices





### Developing a list of top flowgates

- Selected 100 top flowgates in each category:
  - 100 highest binding hours
  - 100 highest U90
  - 100 highest shadow price
  - 100 highest congestion rent
- Merged this list into a set of 171 flowgates top flowgates of 2008 base case
- Obtained the top flowgate list for each of the 5 other scenarios (high/low fuel 2008, base/high/low fuel 2011) using similar approach
- The top flowgates of 2008 base case are shown below by market area, with their appearance in top flowgate lists of other scenarios indicated by color coding



### Developing a list of top flowgates (cont'd)

- We identified 118 flowgates (shown below in white) that appear on the top list in all six scenarios. These are most chronic and persistent constraints in Eastern Interconnection, because they appear under all fuel scenarios and not resolved by planned transmission upgrades between 2007 and 2010
- We also identified 19 flowgates (shown in yellow) which are on the top list in the 2008 Base Case but not on the top list either in the High Fuel or Low Fuel scenarios in the same year
- Finally, we identified 34 flowgates (shown in blue) that are on the top list in 2008, but no longer on the top list in 2011. Presumably, transmission upgrades embedded in the 2010 MMWG case alleviate congestion on these 34 constraints



# Top New England constraints with overall ranking by category

Interties with Hydro Quebec and New Brunswick were modeled using historical flow data and congestion across these interties was not analyzed

			From		Cong			
Constraint	From	To	Market	To Market	Rent	U90	Bind Hrs	Price
North New England Scobie Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	32	18	16	88
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	NEPOOL	NEPOOL	104	10	10	92
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	NEPOOL	NEPOOL	223	96	48	205
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	NEPOOL	NEPOOL	234	13	8	195
New England North-South Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	105	140	96	206

**Color coding:** 

In all scenarios

NOT in high/low fuel



### Top flowgates in NYISO area with overall ranking by category ("from – to" does not indicate direction of congestion

			From	<b>-</b>	0 5 1	1100	5: 111	
Constraint	From	То	Market	To Market	Cong Rent	U90	Bind Hrs	Price
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO	NYPP	NYPP	2	73	44	30
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	9	49	43	45
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO	NYPP	NYPP	25	27	18	71
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	31	19	53	82
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	34	54	54	167
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	41	12	12	95
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	43	57	56	144
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	44	116	117	190
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	67	5	3	120
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	70	25	20	40
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	79	2	2	127
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	85	58	38	41
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	88	7	5	76
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	100	124	73	52
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	112	53	6	177
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	114	80	86	220
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	117	17	11	98
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	123	89	146	93
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	130	136	92	97

**Color coding:** 

In all scenarios

NOT in high/low fuel



# Top flowgates in NYISO area with overall ranking by category (cont'd) ("from – to" does not indicate direction of congestion

			From					
Constraint	From	To	Market	To Market	Cong Rent	U90	Bind Hrs	Price
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	137	15	9	67
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	187	32	39	160
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	357	3	180	356
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	360	65	34	358
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	365	23	366	365
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	368	64	370	368
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	371	86	371	371
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	372	94	373	372
14 I/F WEST CENTRAL CLOSE H	NYISO	NYISO	NYPP	NYPP	56	165	148	172
14 I/F WEST CENTRAL CLOSE L	NYISO	NYISO	NYPP	NYPP	60	144	97	174
1454 - IMO-NYIS	IESO	NYISO	ONTARIO	NYPP	90	151	84	146
Actual:SPRBROOK-TREMONT	NYISO	NYISO	NYPP	NYPP	157	41	65	165
1TSPBKTRMT:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	175	11	57	168
Actual:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	219	16	14	158
Actual:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	220	24	25	159
Actual:RAINEY8W-VERNON-W	NYISO	NYISO	NYPP	NYPP	237	115	90	211
CP10_15_ASTE-WRG_HG A 1_Bas	NYISO	NYISO	NYPP	NYPP	238	29	100	184
Actual:E179 ST-HG 4	NYISO	NYISO	NYPP	NYPP	332	33	338	304
Actual:E179 ST-HG 1	NYISO	NYISO	NYPP	NYPP	333	36	310	308
Actual:L SUCSPH-JAMAICA	NYISO	NYISO	NYPP	NYPP	338	87	46	326

**Color coding:** 

In all scenarios

NOT in high/low fuel



## Top flowgates in PJM area with overall ranking by category ("from – to" does not indicate direction of congestion)

			From		Cong			
Constraint	From	To	Market	To Market	Rent	U90	Bind Hrs	Price
APS South Interface	VAP	AP	PJM	PJM	1	50	98	38
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	3	60	101	100
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	4	84	74	34
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	7	153	168	62
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	6	92	130	78
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	22	126	149	137
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	26	95	81	49
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	30	43	45	39
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	68	99	223	192
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	82	127	124	21
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	144	70	13	203
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	203	114	60	258
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	322	131	69	342
147 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	55	183	203	145
97 - Benton Harbor-Palisades	AEP	METC	PJM	MISO	96	293	242	199
1348 - Erie West-Erie South	PENELEC	PENELEC	PJM	PJM	99	178	132	119
669 - S. Mahwah 1-Waldwick 3	PSEG	NYISO	PJM	NYPP	369	75	368	369
670 - S. Mahwah 2-Waldwick 3	PSEG	NYISO	PJM	NYPP	370	79	369	370
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	21	111	162	161
70 - Branchburg-Flagtown 230	PSEG	PSEG	PJM	PJM	29	34	37	47
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	39	91	94	27
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	64	162	298	176
1-TRIP MANOR-SAKRON BRUNNERI	PL	PL	PJM	PJM	93	207	247	117
NFG3263 - Nelson-Dixon B FLO	NI	NI	PJM	PJM	113	218	259	94

**Color coding:** 

In all scenarios

NOT in high/low fuel

### Top flowgates in MISO area with overall ranking by category ("from – to" does not indicate direction of congestion)

			From					
Constraint	From	То	Market	To Market	Cong Rent	U90	Bind Hrs	Price
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	8	52	80	2
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	14	62	66	4
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	28	66	51	17
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	33	206	147	19
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	36	37	64	13
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	42	69	50	35
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	46	48	23	48
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	47	122	119	44
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	52	209	215	31
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	57	61	71	54
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	61	159	120	33
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	63	44	29	12
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	66	39	52	53
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	78	30	41	56
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	80	47	32	24
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	87	247	187	37
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	97	232	189	69
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	109	100	68	20
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	126	185	126	74
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	129	51	21	75
249 - ATC Flow South	WEC	WPS	MISO	MISO	158	121	67	118

**Color coding:** 

In all scenarios

NOT in high/low fuel



# Top flowgates in MISO area with overall ranking by category (cont'd) ("from – to" does not indicate direction of congestion)

SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	177	59	31	103
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	216	77	184	128
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	235	316	294	91
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	289	105	63	317
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	345	28	17	348
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	49	152	137	29
1240 - Coal Creek Tap-Stanto	GRE	GRE	MISO	MISO	94	135	95	104
1074 - Smith-Hardin Co 345 (	LGEE	LGEE	MISO	MISO	373	97	372	373
246 - Frankfort East-Tyrone	LGEE	LGEE	MISO	MISO	23	72	59	8
81 - Blue Lick-Bullitt Co. 1	LGEE	EKPC	MISO	MISO	24	129	127	11
NFG3033 - Arpin Xformer+Arpi	ALTE	ALTE	MISO	MISO	75	174	143	68
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	83	125	121	61
268 - Greenfield-Lakeview 13	FE	FE	MISO	MISO	84	172	116	55
SPP to MAIN Interface	AECI	AMRN	ENTERGY	MISO	92	239	159	138
1194 - Smith XFM 345/138 Xfm	LGEE	LGEE	MISO	MISO	95	88	140	90
650 - Seneca-Maple 138 (flo)	FE	FE	MISO	MISO	145	193	197	106
1197 - Green River Steel-Clo	LGEE	LGEE	MISO	MISO	151	81	173	112
1133 - Smith 345/138 Xfm (fl	LGEE	LGEE	MISO	MISO	153	63	166	131
861 - Center-Heskett 230	OTP	WAPA	MISO	MAPP	155	142	89	143
664 - State Line-Wolf Lake 1	NIPS	NI	MISO	PJM	167	90	78	156
1552 - MP-IMO_N	MP	IESO	MISO	ONTARIO	367	42	367	367

**Color coding:** 

In all scenarios

NOT in high/low fuel



# Top flowgates in MAPP area with overall ranking by category ("from – to" does not indicate direction of congestion)

			From					
Constraint	From	То	Market	To Market	Cong Rent	U90	Bind Hrs	Price
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	17	4	7	15
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	37	74	36	7
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	65	108	88	14
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	159	109	49	51
SPP 90-FTCAL_S	OPPD	OPPD	MAPP	MAPP	86	154	102	101
1-TRIPS,GARRISN4-GARRISN7- 1	WAPA	WAPA	MAPP	MAPP	148	160	99	80

**Color coding:** 

In all scenarios

NOT in high/low fuel



# Top flowgates in SPP area with overall ranking by category ("from – to" does not indicate direction of congestion)

			From					
Constraint	From	To	Market	To Market	Cong Rent	U90	Bind Hrs	Price
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	5	38	35	32
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	10	68	40	1
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	8	15	18
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	12	78	61	5
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	19	45	33	3
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	35	14	19	10
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	38	56	77	9
SPP118-STOMORLACNEO	SWPA	AECI	SPP	ENTERGY	40	93	82	25
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	48	82	72	6
733 - Toledo Bend-Leesville	CELE	EES	SPP	ENTERGY	50	104	85	16
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	ENTERGY	58	110	62	23
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	ENTERGY	74	130	131	46
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	76	184	108	60
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	141	233	211	58
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	215	118	75	129
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERGY	253	55	42	166
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	364	9	364	364
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	366	35	365	366
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	125	205	218	84
1-TRIPS,AUBURN 6-JEC 6- 1	WERE	WERE	SPP	SPP	54	107	115	73
1-TRIPS,TEC E 3-TECHILE3- 1	WERE	WERE	SPP	SPP	150	85	55	115

**Color coding:** 

In all scenarios

NOT in high/low fuel



## Top flowgates in Entergy area with overall ranking by category ("from – to" does not indicate direction of congestion)

			From					· · · · · · · · · · · · · · · · · · ·
Constraint	From	То	Market	To Market	Cong Rent	U90	Bind Hrs	Price
FG 1376 Coly-Vignes for the	LAGN	EES	ENTERGY	ENTERGY	16	20	30	22
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	ENTERGY	ENTERGY	20	6	4	28
NFG1314 - Little Gypsy-South	EES	EES	ENTERGY	ENTERGY	27	83	111	36
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERGY	ENTERGY	45	98	106	26
FG 1324 WhiteBluff-Sheridan	EES	EES	ENTERGY	ENTERGY	59	164	144	148
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	ENTERGY	ENTERGY	71	180	160	85
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERGY	ENTERGY	72	1	1	42
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	110	21	22	79
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	111	22	24	81
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	115	26	27	87
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERGY	ENTERGY	154	31	26	83
FG 1380 Batesville-Marks for	EES	EES	ENTERGY	ENTERGY	171	40	28	77
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	ENTERGY	ENTERGY	228	101	83	139
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERGY	ENTERGY	281	76	58	194

**Color coding:** 

In all scenarios

NOT in high/low fuel



# Top flowgates in TVA area with overall ranking by category ("from – to" does not indicate direction of congestion)

Constraint	From	To	From Market	To Market	Cong Rent	U90	Bind Hrs	Price
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	103	113	107	66
930 - Hopkins CoBarkley 16	TVA	BREC	TVAUTHOR	MISO	77	139	109	57
1-TRIPS,5DAVAN 2-5GRASL T- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	98	197	164	108
1-TRIPS,5J VIL 2-5DICKSON- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	119	106	134	86
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	124	133	138	89
1215 - Cumberland-Johnsonvil	TVA	TVA	TVAUTHOR	TVAUTHOR	212	71	327	309
1216 - Cumberland-Davidson 5	TVA	TVA	TVAUTHOR	TVAUTHOR	13	46	79	96
1-TRIPS,5DAVSN 2-5GRASL T- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	53	158	112	65

**Color coding:** 

In all scenarios

NOT in high/low fuel



Top flowgates in Southern area with overall ranking by category

No flowgates monitored within Southern control area appear on the top flowgates list



# Top flowgates in VACAR (excluding Dominion) with overall ranking by category

("from – to" does not indicate direction of congestion)

Constraint	From	То	From Market	To Market	Cong Rent	U90	Bind Hrs	Price
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	89	145	87	59
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	91	117	76	43
1-TRIPS,6BLUFFTN-3BLUFFTN- 2	SCPSA	SCPSA	VACAR	VACAR	138	155	113	63

**Color coding:** 

In all scenarios

NOT in high/low fuel



## Top flowgates in Florida area with overall ranking by category ("from – to" does not indicate direction of congestion)

Constraint	From	To	From Market	To Market	Cong Rent	U90	Bind Hrs	Price
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHERN	15	102	70	111
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	106	161	114	70
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	136	120	122	72
FG 1519 8THALMAN 500 DUVAL 5	SOCO	FPL	SOUTHERN	FRCC	81	119	154	204
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	18	123	93	99
1-TRIPS,RIVER-N -GANNON - 1	TECO	TECO	FRCC	FRCC	51	128	91	50

**Color coding:** 

In all scenarios

NOT in high/low fuel



## Top flowgates in Ontario area with overall ranking by category ("from – to" does not indicate direction of congestion)

		·	From			·		
Constraint	From	То	Market	To Market	Cong Rent	U90	Bind Hrs	Price
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	62	225	169	133
East West Transfer West	IESO	IESO	ONTARIO	ONTARIO	69	67	47	64
1456 - Buchannon Longwood In	IESO	IESO	ONTARIO	ONTARIO	73	200	150	208

**Color coding:** 

In all scenarios

NOT in high/low fuel



### **Several Important Observations**

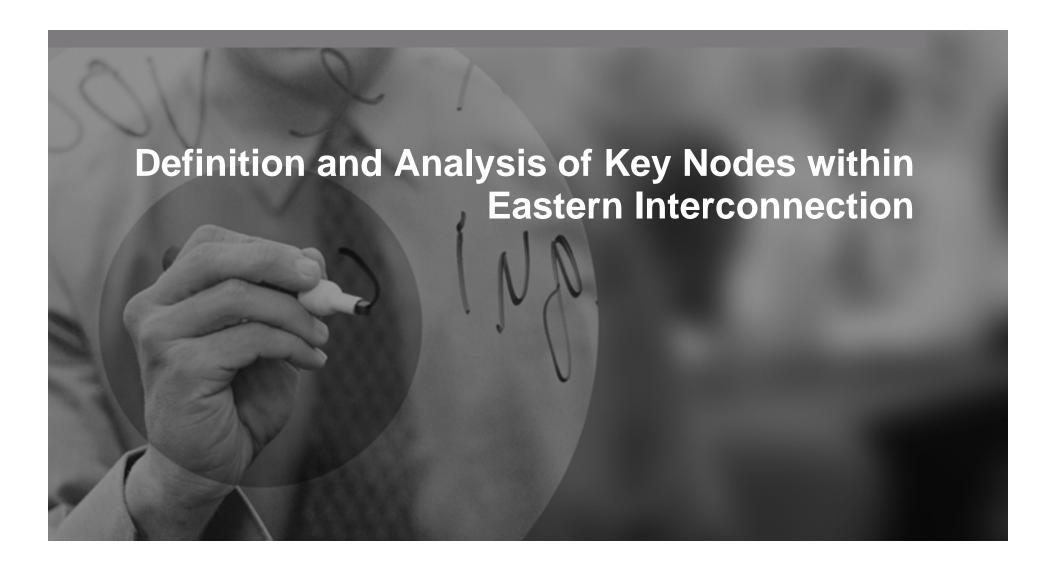
- Top flowgates are located both within regional markets and span across market boundaries
- A significant portion of top flowgates appear on the tie lines between two control areas
- A significant portion of top flowgates are located within individual control areas



### **Supporting Materials for Step 1**

 Detailed results of congestion analysis of all flowgates by year by scenario are provided in an Appendix 1







### Objectives of step 2

- We envision transmission corridors as means of connecting end markets, or nodes, on the power grid
- For that purpose
  - nodes should represent significant concentrations of loads and/or generation within electrically and geographically contiguous areas;
  - That should help identify nodes with surplus of generating capacity and those short on generation capacity
  - Major transmission facilities should lie outside of nodes
  - That should help identify where congestion occurs between nodes
- Control areas are not a good proxy for nodes because congestion frequently occurs within control areas, as congestion analysis of flowgates clearly demonstrates



### **Defining Nodes**

#### • Our approach in defining nodes varied by market:

- For markets administered by NY ISO and ISO New England, we used their respective LMP zones as a proxy for nodes. This is because congestion typically occurs between these zones rather than within these zones. An exception is NYISO Zone J (New York City) but it has been decided not to break Zone J into multiple nodes
- For all other markets, cluster analysis of buses was used to determine nodes



### **Cluster Analysis**

- Starting with the summer peak load flow case we cluster load and generation buses within each ACPF area (except NYCA and NEPOOL) using shift factors
  - Two buses are electrically similar if shift factors on all monitored flowgates are similar.
     Similar buses are placed in one cluster. Clustering algorithms minimize diversion within each cluster while maximizing diversion among clusters
- 1 cluster = 1 node
- We used FASTCLUS algorithm in SAS
- The number of clusters in each ACPF area were determined to reduce the index of diversion within largest clusters to the level below 10%: this index represents the average level of dissimilarity of flow patterns caused by power injection at different buses within the same cluster
- For each cluster two weight indicators were measured load weight equal to peak demand at all load buses within a cluster and generation weight – total installed generation capacity within a cluster



#### **Highlights of Node Definition Results**

- Cluster analysis identifying approximately 1079 clusters of load and generation buses within Eastern Interconnection (excluding NYISO and ISO-NE)
- Using cluster weights, we determined the following lists
  - List A (top 90 clusters based on total weight)
  - List B (top 90 clusters based on net generation weight)
  - List C (top 90 clusters based on net load weight)
- From these we defined 6 categories of clusters
  - 1: A&(-B)&(-C) [meaning clusters that are on A list but neither on B list, nor on C list
  - 2: A&B
  - 3: A&C
  - 4: B&(-A)
  - 5: C&(-A)
  - 6: all other
- All category 1 through 5 clusters were designated as nodes
- In addition, in control areas which had only category 6 clusters, a cluster with the largest total weight was designated as a node
- We identified 234 nodes based on the above cluster analysis. In addition, we defined 11 nodes in NYISO (Zones A through K) and 10 nodes in New England. In total we defined 255 nodes in Eastern Interconnection



# New England and New York nodes coincide with LMP Zones

			Mumahan					Total Gen	Total Load	Davaant	Davaant	Doroont
			Number of		Gen	Load	Total Waight	Weight in		Percent Total	Percent Gen	Percent Load
Market	AREA		~ -				_	_	Weight in Hubs			
	CT	OI HUDS	Ciusiers			Weight		Hubs			Weight	Weight
NEPOOL NEPOOL	ME	1	1	8,164 5,824	4,244 3,301	3,920 2,522	8,164 5,824	4,244 3,301	3,920 2,522	100.00% 100.00%	100.00% 100.00%	
		1	1									
NEPOOL	NEBOS	1	1	8,306	2,401	5,904	8,306	2,401	5,904	100.00%	100.00%	
NEPOOL	NH	1	1	6,653	4,032	2,621	6,653	4,032	2,621	100.00%	100.00%	
	NWKST	1	1	2,293	769	1,524	1,908	385	1,524	83.23%	100.00%	
	RI	1	1	4,004	1,801	2,203	4,004	1,801	2,203	100.00%	100.00%	
NEPOOL	SEMA	1	1	12,790	8,812	3,978	10,056	6,078	3,978	78.62%	100.00%	
NEPOOL	SWCT	1	1	6,702	4,853	1,850	4,276	2,426	1,850	63.80%	100.00%	
NEPOOL	VT	1	1	1,962	772	1,190	1,962	772	1,190	100.00%	100.00%	
NEPOOL	WCMA	1	1	7,412	3,995	3,417	7,412	3,995	3,417	100.00%	100.00%	100.00%
	NYA	1	1	7,366	4,866	2,500	7,366	4,866	2,500	100.00%	100.00%	100.00%
NYISO	NYB	1	1	2,402	643	1,759	2,402	643	1,759	100.00%	100.00%	100.00%
NYISO	NYC	1	1	9,199	6,542	2,657	9,199	6,542	2,657	100.00%	100.00%	100.00%
NYISO	NYD	1	1	1,860	1,180	681	1,860	1,180	681	100.00%	100.00%	100.00%
NYISO	NYE	1	1	1,872	963	909	1,872	963	909	100.00%	100.00%	100.00%
NYISO	NYF	1	1	5,858	3,875	1,983	5,858	3,875	1,983	100.00%	100.00%	100.00%
NYISO	NYG	1	1	5,482	3,288	2,195	5,482	3,288	2,195	100.00%	100.00%	100.00%
NYISO	NYH	1	1	2,991	2,018	973	2,991	2,018	973	100.00%	100.00%	100.00%
	NYI	1	1	1,478	2	1,476	1,478	2	1,476	100.00%	100.00%	
NYISO	NYJ	1	1	21,924	10,432	11,493	21,924	10,432	11,493	100.00%	100.00%	
NYISO	NYK	1	1	10,584	5,295	5,289	10,584	5,295	5,289	100.00%		



## **Clustering results for PJM and Ontario**

			Number					Total Gen	Total Load	Percent	Percent	Percent
		Number	of		Gen	Load	Total Weight		Weight in	Total	Gen	Load
Market			Clusters	Total Weight	Weight	Weight	in Hubs	Hubs	_	Weight	Weight	Weight
ONTARIO	IESO	6		55,383	29,028	26,355	40,644	20,278	20,366	73.39%		
PJM	AE	1	10	4,025	1,259	2,766	913	77	836	22.68%	41.75%	30.22%
PJM	AEP	5	10	53,942	29,431	24,511	48,967	26,920	22,048	90.78%	92.12%	89.95%
	AP	4	10	18,638	9,954	8,684	13,159	6,938	6,221	70.60%	70.01%	71.64%
	BGE	5	10	10,924	3,943	6,981	9,660	3,564	6,096	88.43%	89.48%	87.32%
	DLCO	2	10	6,246	3,441	2,805	2,303	1,644	659	36.88%	46.88%	23.51%
PJM	DP&L	1	10	7,692	3,528	4,164	3,164	1,399	1,765	41.13%	39.18%	42.39%
PJM	DPL	2	8	7,684	4,076	3,608	6,545	3,892	2,652	85.17%	95.23%	73.52%
PJM	JCPL	2	10	10,378	4,090	6,288	5,734	1,207	4,527	55.25%		
PJM	METED	1	10	5,962	3,240	2,722	1,714	860	854	28.75%	26.18%	31.39%
	NI	7	20	49,112	26,012	23,100	43,316	22,612	20,704	88.20%	88.51%	
PJM	OVEC	1	4	3,727	3,692	35	1,490	1,480	10	39.98%	41.29%	28.57%
PJM	PECO	3	10	16,871	8,401	8,470	8,072	3,944	4,128	47.84%	48.03%	48.74%
	PENELEC	1	10	7,592	4,800	2,792	3,811	2,615	1,196	50.20%	53.52%	42.84%
	PEPCO	5	10	12,750	6,090	6,660	8,229	3,493	4,736	64.54%		
PJM	PJM500	6	. •	16,286	16,286	-	13,776	13,776	-	84.59%	86.62%	
PJM	PL	3	10	15,175	8,311	6,864	5,121	2,788	2,333	33.75%	34.58%	33.99%
PJM	PSEG	4	10	19,010	8,328	10,682	16,423	7,089	9,334	86.39%	88.65%	87.38%
PJM	RECO	1	8	476	-	476	146	-	146	30.62%	0.00%	30.62%
PJM	UGI	1	10	273	98	176	95	42	53	34.58%	48.54%	
PJM	VAP	6	35	41,180	22,630	18,550	26,826	16,985	9,841	65.14%	75.43%	53.05%



## **Clustering Results for MISO**

			Number of		Gen	Load	Total Weight	Total Gen Weight in	Total Load Weight in	Percent Total	Percent Gen	Percent Load
Market	AREA	of Hubs	Clusters	Total Weight	Weight		_	Hubs	Hubs	Weight	Weight	Weight
MISO	ALTE	1	10		4,475	2,819	2,198	1,574	624	30.14%		
MISO	ALTW	1	10	9,085	4,563	4,522	2,084	980	1,103	22.93%	26.09%	24.39%
MISO	AMRN	2	15	26,931	13,766	13,165	12,445	5,170	7,275	46.21%	37.76%	55.26%
MISO	BREC	1	10	3,437	1,810	1,627	1,915	1,355	560	55.71%	74.86%	34.41%
MISO	CILC	1	10	2,314	1,152	1,162	1,266	756	510	54.71%	65.51%	43.90%
MISO	CIN	5	8	28,328	14,333	13,995	26,347	13,359	12,988	93.01%	94.12%	92.80%
MISO	CWLP	1	10	1,106	620	486	527	300	227	47.68%	48.74%	46.77%
MISO	DPC	1	10	2,037	1,071	966	939	601	338	46.09%	54.42%	34.98%
MISO	EEI	1	3	1,382	1,292	90	543	507	36	39.29%	38.73%	39.91%
MISO	EKPC	1	10	4,730	2,519	2,211	1,861	1,396	465	39.34%	47.39%	21.02%
MISO	FE	7	10	27,315	13,246	14,070	23,640	11,176	12,464	86.54%	84.92%	88.59%
MISO	GRE	1	10	4,522	2,944	1,578	1,383	272	1,111	30.59%	11.01%	70.42%
MISO	HE	1	10	1,943	1,399	544	1,120	1,000	120	57.61%	70.75%	21.97%
MISO	ΙP	2	10	10,119	5,535	4,584	5,697	4,058	1,639	56.30%	62.44%	35.75%
MISO	IPL	3	10	6,325	3,250	3,074	4,872	2,457	2,414	77.03%	71.97%	78.53%
MISO	ITC	4	10	24,902	11,876	13,026	21,373	9,775	11,598	85.83%	82.52%	89.04%



## **Clustering Results for MISO (cont'd)**

		Number	Number		Gen	Load	Total Weight	Total Gen Weight in	Total Load Weight in	Percent Total	Percent Gen	Percent Load
Market	AREA		Clusters	Total Weight			in Hubs	Hubs	Hubs	Weight	Weight	Weight
MISO	LGEE	4	10		8,250	7,698	8,717	3,613	5,103	54.66%		
MISO	METC	3	10		12,480	10,516	16,969	10,172	6,796	73.79%	79.26%	
MISO	MGE	1	10	1,252	438	813	769	366	403	61.41%	82.95%	49.51%
MISO	MIPU	1	10	4,340	2,418	1,922	1,800	1,249	551	41.46%	51.57%	28.64%
MISO	MP	1	10	3,813	2,134	1,679	1,333	508	824	34.96%	40.69%	49.11%
MISO	NIPS	1	10	6,883	3,436	3,447	4,573	2,880	1,693	66.44%	73.01%	49.11%
MISO	OTP	2	10	3,352	1,457	1,895	1,941	1,166	775	57.92%	86.51%	40.91%
MISO	SIGE	1	10	3,441	1,478	1,963	909	135	774	26.41%	10.49%	39.42%
MISO	SIPC	1	10	675	412	263	465	412	53	68.84%	100.00%	20.03%
MISO	SMMPA	1	10	697	309	388	193	111	82	27.77%	41.83%	21.28%
MISO	SUNC	1	10	1,815	1,462	353	956	840	116	52.67%	54.38%	32.80%
MISO	UPPC	1	10	223	53	169	77	2	75	34.63%	48.75%	44.20%
MISO	WEC	3	10	15,435	8,048	7,387	12,423	6,645	5,777	80.48%	84.80%	78.21%
MISO	WEPL	1	10	948	372	576	261	137	124	27.48%	36.83%	21.45%
MISO	WPS	1	10	5,753	3,084	2,669	1,003	399	604	17.43%	29.84%	22.63%
MISO	XEL	1	10	19,501	9,287	10,215	17,489	9,867	7,622	89.68%	79.07%	74.62%



## **Clustering Results for SPP**

			Number					Total Gen	Total Load	Percent	Percent	Percent
		Number	of		Gen	Load	Total Weight	Weight in	Weight in	Total	Gen	Load
Market	AREA	of Hubs	Clusters	Total Weight	Weight	Weight	in Hubs	Hubs	Hubs	Weight	Weight	Weight
SPP	AEPW	3	10	26,358	16,633	9,725	23,747	15,344	8,403	90.10%	91.94%	86.40%
SPP	CELE	1	10	6,333	4,083	2,250	2,562	1,820	742	40.46%	48.75%	32.98%
SPP	EMDE	1	10	2,426	1,338	1,088	1,510	1,052	458	62.26%	79.30%	42.12%
SPP	GRDA	1	10	2,387	1,595	792	1,027	849	179	43.03%	52.74%	22.53%
SPP	INDN	1	10	606	288	318	220	143	77	36.26%	49.65%	24.15%
SPP	KACP	2	10	8,039	4,403	3,636	1,961	670	1,291	24.39%	28.18%	35.49%
SPP	KACY	1	10	1,179	680	499	413	316	97	35.00%	46.47%	19.37%
SPP	LAFA	1	10	731	295	436	282	175	107	38.60%	59.32%	24.58%
SPP	LEPA	1	10	452	201	251	162	89	73	35.93%	45.37%	29.24%
SPP	MIDW	1	10	377	32	345	111	19	92	29.46%	78.16%	26.68%
SPP	OKGE	1	10	13,768	7,931	5,837	4,462	2,059	2,403	32.41%	25.48%	41.17%
SPP	OMPA	1	10	800	163	637	481	163	318	60.07%	100.00%	49.86%
SPP	SPRM	1	10	1,457	689	768	582	236	346	39.93%	40.93%	45.02%
SPP	SPS	1	10	11,914	7,175	4,740	7,393	4,420	2,973	62.05%	63.18%	62.72%
SPP	SWPA	1	10	3,016	2,186	830	866	478	388	28.71%	21.86%	46.75%
SPP	WERE	3	10	12,806	7,356	5,450	10,320	6,536	3,783	80.58%	89.87%	69.42%
SPP	WFEC	1	10	2,396	1,131	1,265	659	337	322	27.52%	35.36%	25.49%



# **Clustering Results for VACAR (except Dominion) and MAPP**

			Number					Total Gen	Total Load	Percent	Percent	Percent
		Number	of		Gen	Load	Total Weight	Weight in	Weight in	Total	Gen	Load
Market	AREA	of Hubs	Clusters	Total Weight	Weight	Weight	in Hubs	Hubs	Hubs	Weight	Weight	Weight
MAPP	MEC	1	10	11,569	6,115	5,454	5,049	3,115	1,933	43.64%	56.07%	35.45%
MAPP	MPW	1	7	418	253	165	201	151	50	47.98%	59.68%	30.04%
MAPP	NPPD	3	10	7,789	4,648	3,142	5,387	3,281	2,106	69.15%	69.83%	67.02%
MAPP	OPPD	1	10	4,679	2,187	2,492	2,102	416	1,686	44.92%	16.38%	67.65%
MAPP	WAPA	1	10	11,077	7,970	3,107	3,173	2,360	813	28.65%	27.90%	26.18%
VACAR	CPLE	2	10	24,266	12,105	12,161	19,285	9,910	9,375	79.47%	81.01%	77.09%
VACAR	CPLW	1	10	2,177	1,389	788	898	712	186	41.24%	49.26%	23.56%
VACAR	DUK	4	10	42,741	22,228	20,512	40,388	21,046	19,341	94.49%	94.68%	94.29%
VACAR	SCEG	2	10	11,957	6,929	5,029	10,603	5,906	4,696	88.67%	88.26%	93.39%
VACAR	SCPSA	2	10	8,992	4,348	4,644	6,523	3,287	3,236	72.54%	68.63%	69.68%
VACAR	YAD	1	1	17	13	4	31	27	4	177.07%	100.00%	100.00%



## Clustering Results for Entergy and TVA

			Number					Total Gen		Percent	Percent	Percent
		Number	of		Gen	Load	Total Weight	Weight in	Weight in	Total	Gen	Load
Market	AREA	of Hubs	Clusters	Total Weight	Weight	Weight	in Hubs	Hubs	Hubs	Weight	Weight	Weight
ENTERGY	AECI	4	10	8,245	4,190	4,055	4,743	2,270	2,472	57.52%	52.65%	60.97%
ENTERGY	CWLD	1	9	301	-	301	48	-	48	15.95%	0.00%	15.95%
ENTERGY	DENL	1	9	293	14	279	81	-	81	27.47%	100.00%	28.85%
ENTERGY	DERS	1	1	143	75	68	143	75	68	100.00%	100.00%	100.00%
ENTERGY	EES	9	10	68,561	39,819	28,743	67,181	38,894	28,287	97.99%	97.92%	98.42%
ENTERGY	LAGN	1	10	3,427	2,349	1,078	2,342	2,179	163	68.32%	92.24%	15.09%
TVAUTHOR	BCA	1	1	94	80	14	94	80	14	100.00%	100.00%	100.00%
TVAUTHOR	DOE	1	5	1,374	474	900	783	474	309	56.96%	100.00%	34.30%
TVAUTHOR	TVA	7	10	75,333	42,281	33,053	75,120	42,281	32,839	99.72%	100.00%	99.35%



### **Clustering Results for Southern and Florida**

Market	AREA	Number	Number of Clusters		Gen Weight	Load Weight	_	_	Weight in	Total	Gen	Percent Load Weight
FRCC	FMP	1	8	299	137	162	167	137	30	56.06%	100.00%	18.81%
FRCC	FPC	4	10	21,255	10,286	10,969	15,060	7,791	7,269	70.85%	72.91%	66.27%
FRCC	FPL	4	10	45,594	23,197	22,397	42,621	22,424	20,197	93.48%	97.34%	90.18%
FRCC	FTP	1	7	261	142	119	171	142	29	65.34%	100.00%	24.09%
FRCC	GVL	1	10	1,052	549	503	536	423	113	50.91%	69.00%	22.41%
FRCC	HST	1	1	78	-	78	78	-	78	100.00%	0.00%	100.00%
FRCC	JEA	1	10	6,521	3,628	2,893	2,787	1,605	1,182	42.74%	37.06%	40.85%
FRCC	KEY	1	1	949	811	138	949	811	138	100.00%	100.00%	100.00%
FRCC	KIS	1	10	722	421	302	411	358	53	56.85%	62.30%	17.54%
FRCC	LAK	1	10	1,991	1,331	660	895	777	118	44.95%	65.65%	17.87%
FRCC	LWU	1	1	287	205	82	287	205	82	100.00%	100.00%	100.00%
FRCC	NSB	1	1	566	480	86	566	480	86	100.00%	100.00%	100.00%
FRCC	OUC	1	10	3,021	1,785	1,236	960	887	73	31.77%	57.27%	5.88%
FRCC	RCU	1	8	195	-	195	38	-	38	19.42%	0.00%	19.42%
FRCC	SEC	1	7	2,381	2,125	256	1,316	1,316	-	55.26%	70.19%	0.00%
FRCC	STK	1	1	17	-	17	17	-	17	100.00%	0.00%	100.00%
FRCC	TAL	1	10	1,258	652	606	507	295	211	40.27%	52.76%	34.88%
FRCC	TECO	2	10	10,282	6,266	4,016	6,007	3,499	2,507	58.42%	59.05%	62.43%
SOUTHERN	AEC	1	10	2,495	1,481	1,014	1,129	881	248	45.26%	57.80%	24.50%
SOUTHERN	SMEPA	1	10	1,374	684	690	433	248	184	31.48%	53.10%	26.74%
SOUTHERN	SOCO	15	35	107,931	60,597	47,335	91,634	52,053	39,582	84.90%	84.90%	83.62%



### Geographical attributes and naming convention

- Prof. Tom Overbye from University of Illinois at Urbana-Champaign provided geographical coordinates for generator and load buses at substation level
- CRA then used a GIS database to identify for each bus its state, county and nearest metropolitan statistical area (MSA) as well as basic population and economic statistics
- GIS information was used to develop a naming convention of nodes:
  - Node name =
     ACPF area name +
     unique cluster number +
     identifier such as

"MSA" if node weight is predominantly in that MSA, or

"County" if node weight is predominantly in that county or

"STA" if only the state name is apparent or

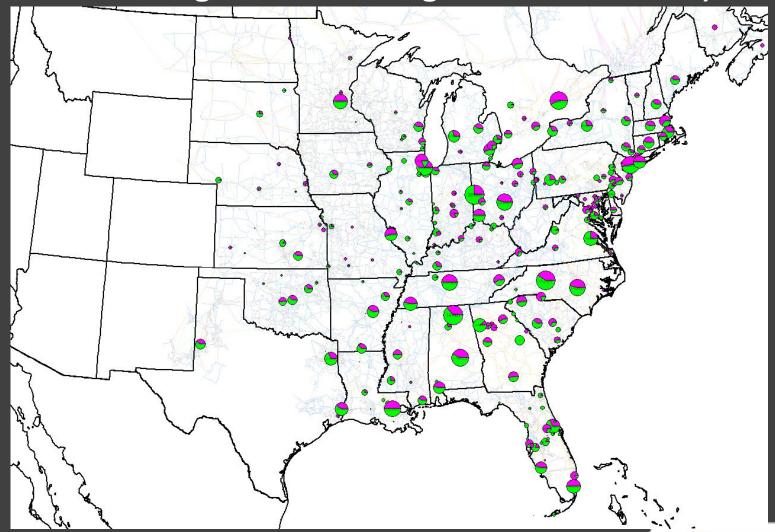
"GEN" if cluster is named after the largest generating unit it contains

name of the identifier +

"G" for clusters with higher generation weight and "L" for clusters with higher load weight

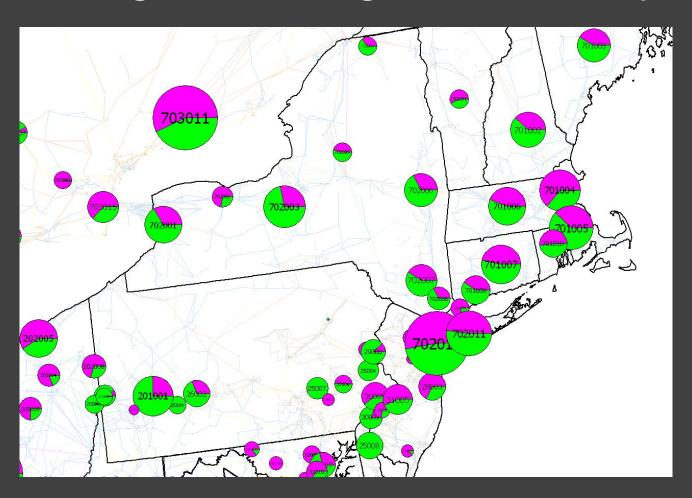


Nodes Visualized (Circle area reflects node weight, green reflects generation, magenta reflects load)



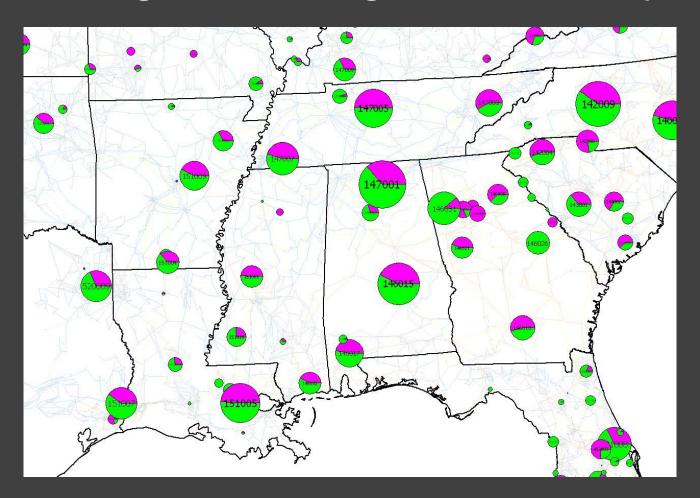


# Northeastern Nodes (Circle area reflects node weight, green reflects generation, magenta reflects load)



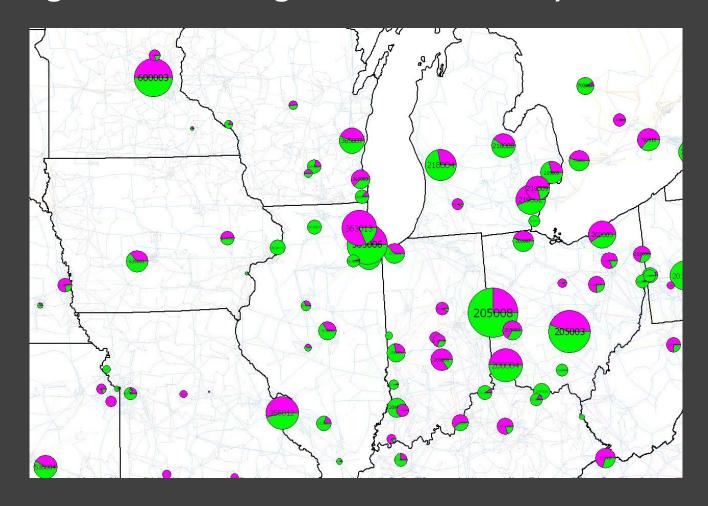


# Southeastern Nodes (Circle area reflects node weight, green reflects generation, magenta reflects load)



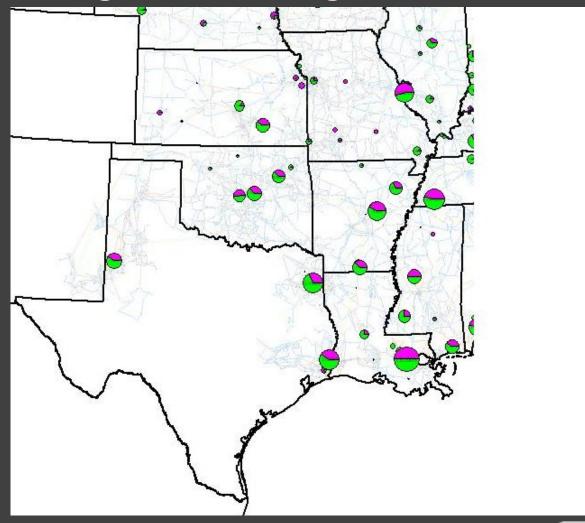


# Midwest Nodes (Circle area reflects node weight, green reflects generation, magenta reflects load)





Southwest Nodes (Circle area reflects node weight, green reflects generation, magenta reflects load)





### Indicators computed for each node by years by scenario

#### For each node compute

- Average net injection
- Number of hours with positive net injection (node acts as a source)
- Average and maximum positive net injection
- Number of hours with negative net injection (node acts as a sink)
- Average and max negative net injection
- Average price and standard deviation over a one year period
- Average price and standard deviation of prices over hours when node acts as a source
- Average price and standard deviation of prices over hours when node acts as a sink
- Revenue surplus for source nodes: a product of average net injection times price times number of hours node acts as a source
- Revenue shortage for sink nodes: a product of average net injection times price times number of hours node acts as a sink



# **Top 20 Sink Nodes in Eastern Interconnection (2008 Base Case)**

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413				1
PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	20.86	-1,865	2
	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	19.55		3
	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	24.14	-1,344	
	IESO_11_G	8784	9,529	12,779	-3,007	-6,111	44.34	17.06	-1,171	5
	NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	19.67	-1,104	6
	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	24.03	-1,053	7
	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,115	-3,574	50.47	17.76	-937	8
FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,856	-3,553	57.11	18.72		9
PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,730	-2,599	60.40	22.76	-918	_
	CIN_1_MSA_Indianapolis_L	8784	816	4,274	-2,181	-3,310			-831	
	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,072	-4,218	45.13	17.50	-822	12
SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	50.79	17.62	-816	13
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,807	-2,983	50.78	17.72	-806	14
NEPOOL	NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,898	63.65	15.74	-759	15
FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335	58.48	19.77	-756	16
MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,652	-2,690	51.03	21.34	-740	17
NEPOOL	NEPOOL_6_WCMA	8643	4,285	3,417	-1,343	-3,453	63.68	15.83	-739	18
TVAUTHOR	TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	18.90	-655	19
PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	17.89	-638	20



# **Top 20 Source Nodes in Eastern Interconnection (2008 Base Case)**

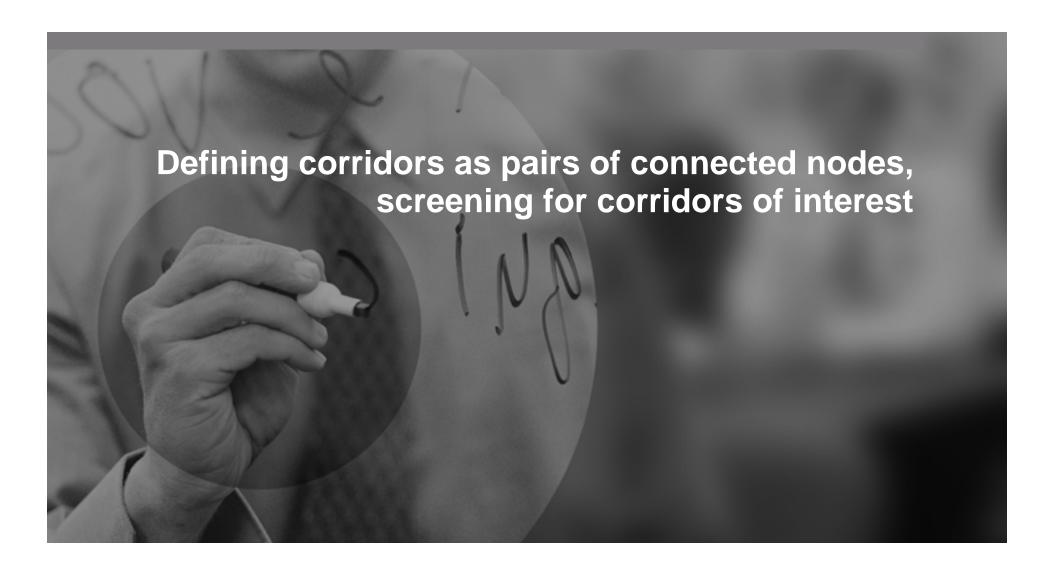
										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	16.80	2,394	1
	SOCO_26_MSA_Macon_G	8784	6,802	-	5,109					1 2
	SOCO_31_MSA_Atlanta_G	8775	11,765	1,583	3,912	9,527			1,744	1 3
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,409	6,440	57.98	19.56	1,736	6 4
PJM	PJM500_8_MSA_Philadelphia_G	8784	3,914	-	3,134	3,868	61.77	20.82	1,701	
VACAR	DUK_9_MSA_Charlotte_G	8780	14,681	9,966	3,106	5,530	50.48	20.13	1,377	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	17.09	1,374	
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26	19.12	1,205	8
PJM	PJM500_7_MSA_York-Hanover_G	8784	2,696	-	2,195	2,570	60.81	20.77	1,172	
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	17.39	1,144	10
	NEPOOL_5_SEMA	8784	6,454	3,978	1,952	3,703	63.66	15.71	1,092	
FRCC	TECO_3_MSA_Tampa_G	8784	3,733	1,026	2,075	3,069	58.32	19.39	1,063	
FRCC	FPL_8_MSA_PortStLucie_G	8763	10,364	4,623	1,943	5,374	58.77	19.82	1,001	13
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	44.36	17.02	975	14
MISO	CIN_8_MSA_Evansville_G	8784	3,657	260	2,476	3,391	43.10	16.97	937	15
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65	13.72	934	16
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	65.27	17.22	906	17
PJM	DPL_8_GEN_Killen_G	8784	2,964	-	2,184	2,940	45.08	16.69	865	18
PJM	PJM500_5_MSA_DC_G	8784	1,730	-	1,516	1,730	61.31	22.59	817	19
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68	15.94	800	20



### **Supporting Materials for Step 2**

- A summary of clustering results are provided in Appendix 2
- Results for all source nodes and all sink nodes are provided in Appendix 3





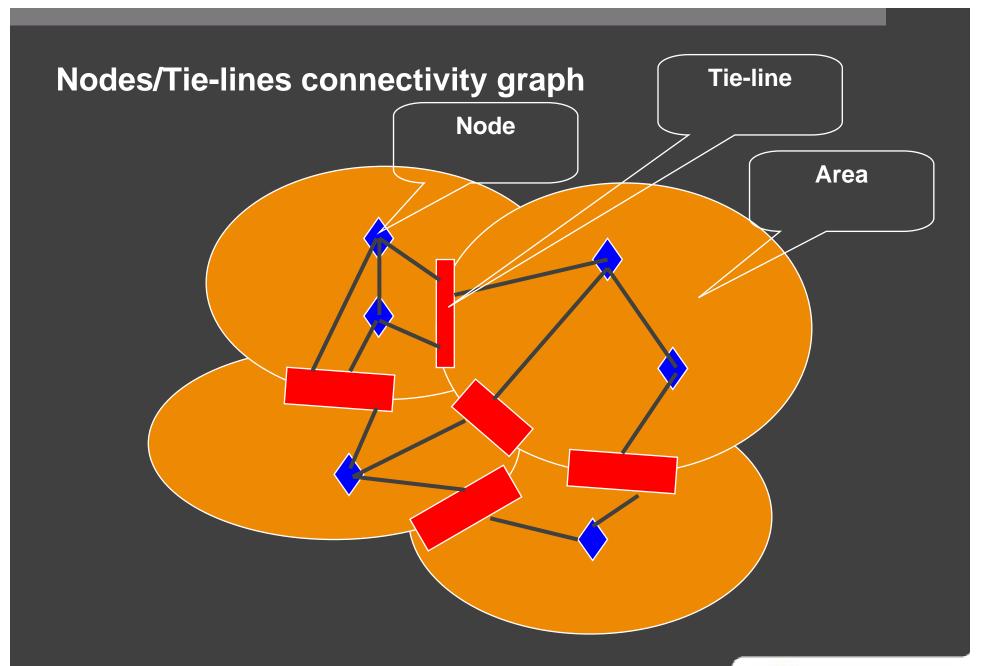


### Preliminary Definition of a "transmission corridor"

For purpose of modeling, we define transmission corridor as a complex transmission path between two nodes

- A corridor may have one or more of the following characteristics:
  - It may extend across transmission owners or control areas
  - It may contain one or more existing transmission system facilities
  - It may or may not be chosen as a NIETC







#### Nodes/Tie-lines network

- We establish direct node-to-node connectivity for nodes that belong to the same ACPF area
- Nodes in neighboring areas are connected only through a tie-line connecting these areas
- Nodes contain only generation and load buses and by construction all constrained elements are most likely outside of nodes
- Corridor are defined on two levels:
  - On a high level, corridor is defined as paths on the nodes/tie-lines network
  - On a low level, each segment of the nodes/tie-line network is defined by all transmission elements comprising the segment (e.g. all paths connecting one node to another inside an area or a node to a tie-line)
- For the above identified set of nodes we constructed this connectivity graph for the Eastern Interconnection considering 255 nodes identified at Step 2
- This connectivity graph contains 4376 direct corridors. Analysis of congestion in that many corridors appears impractical
- Screening of corridors based on reasonable screening criteria is needed



### Screening of corridors: PTDF analysis

- First we computed Power Transfer Distribution Factors (PTDFs) for all corridors with respect to top flowgates identified at step 1
- It is a common practice in the industry that a request for a point-to-point power transfer to be denied if the transfer has a PTDF on a limiting constraint in excess of 5%
- A corridor could effectively be considered as a direction of a power transfer
- If this corridor's PTDF with respect to a flowgate exceeds 5%, we assume that the flowgate could potentially limit the corridor and therefore is significant for that corridor analysis. At the same time, power flow along the corridor makes a significant impact on that flowgate
- Based on that consideration, we screened for all corridor/flowgate combinations which resulted in PTDFs of 5% or higher in absolute value
- That screening indicated the following:
  - 3434 corridors (out of 4376) have significant PTDFs with respect to at least one of the top flowgates. Thus, only 942 corridors could be screened out on that basis
  - 125 top flowgates (out of 154 initially identified in the 2008 Base Case) impact at least one corridor. 29 flowgates appear to impact no corridors and could be considered as local constraints



### Screening by paring sources and sinks

- It appears that a much more efficient screening approach is based on paring source and sink corridors using very simple screening rules:
  - All source nodes should have at least 1000 MW of maximum net injection
  - All sink nodes should have at least 1000 MW of maximum net withdrawal
  - There should be at least \$1/MWh average over a year price differential between a source and a sink
- Application of these screening rules dramatically reduces the number of corridors
- Thus, in the 2008 Base Case the number of corridors is reduced to 405. 2011 Base Case shows 357 corridors



### Why not reduce number of corridors further down?

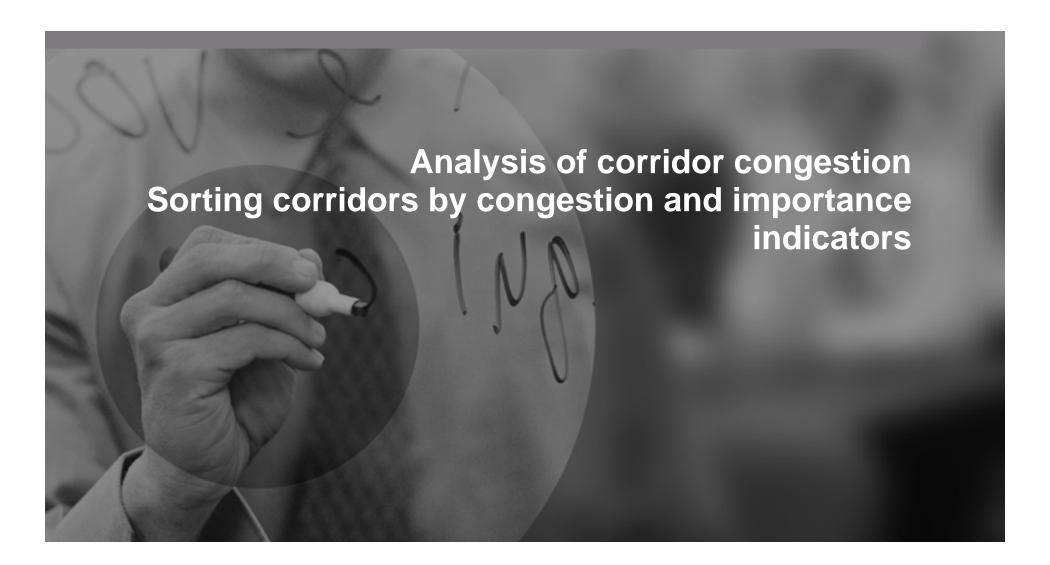
- Our approach at this time is to be inclusive rather than exclusive
- We consider this screening as preliminary until all screening criteria have been finalized and agreed upon
- Reducing number of screened corridors prior to applying a comprehensive set of criteria could unjustifiably eliminate important corridors



### **Supporting Materials for Step 3**

 Appendix 4 contains basic information for screened corridors by year by scenario







### **Congestion indices for corridors**

- For each pre-screened corridor we compute two congestion indices:
  - U90 index
  - Price differential between source node and sink node
- These indices as applied to corridor are discussed below



### A U90 Congestion Index for a Corridor

- Let F1, F2, ..., Fn be flowgates affecting a corridor A→B
- The limit each flowgate Fj places on a corridor is given by the formula:

- Using that formula we can find the most limiting flowgate for the corridor A→B in each hour
- For the most limiting flowgate, we determine its level of utilization (% loading relative to its limit)
- That percentage is taken as the utilization index of the entire corridor in the hour
- U90 for the corridor is defined as number of hours or percent of time corridor's utilization index exceeds 90%

$$K_{j} = \frac{L_{j} - F_{j}}{PTDF(F_{j} \mid A \to B)}$$

 $L_i$  – flowgate limit

 $\overline{F_i}$  - flowgate flow

 $J = \underset{j}{\operatorname{arg \, min}} K_j - \operatorname{index \, of \, the \, most}$ 

binding flowgate

$$Index = \frac{L_J - F_J}{L_J}$$



#### Price differential for the corridor

- Imagine that we connect end markets (nodes) with a new notional line carrying 1 MW
- If this line carries 1 MW flow, this flow is diverted from other parts of the transmission system and, as a result, some constrained elements become relieved, while congestion in other elements may become exacerbated
- The underlying mathematics demonstrates that the resulting flow reduction for each flowgate F would be equal to PTDF(F|A→B)
- If we price flow reduction on each flowgate at its shadow price, the overall system-wide marginal cost reduction will be exactly equal to price differential between the source and sink points of the hypothetical 1 MW line
- Enforcing corridors with a higher price differential have a greater on the margin potential for congestion relief than enforcing corridors with a lower price differential



### Examples of corridor screening by congestion

- Following are examples of corridor screenings performed on the 2008 Base Case set of candidate corridors using the following rules:
  - Source node must serve as a source for over 4000 hours
  - Sink node must serve as a sink for over 4000 hours
  - Choose one corridor per SOURCE market area with the highest price differential between source and sink
  - Choose one corridor per SINK market area with the highest price differential between source and sink
  - Choose one corridor per SOURCE market area with the highest U90 indicator
  - Choose one corridor per SINK market area with the highest U90 indicator



## Regional corridors with the highest price differential one corridor per source market area

Source Hub Ir	formation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
ENTERGY	EES_2_MSA_Batesville_G	8784	SPP	OKGE_4_MSA_OklahomaCity_L	8783	13.2	5940	68%	
FRCC	SEC_6_MSA_Palatka_G	8160	FRCC	FPL_7_MSA_Miami_L	8784	5.1	4748	54%	
MAPP	NPPD_4_GEN_Gentleman_G	8760	MAPP	OPPD_5_MSA_Omaha_L	8784	16.7	8367	95%	
MISO	OTP_9_GEN_BigStone_G	8784	MISO	XEL_3_MSA_Minneapolis_G	4672	23.0	7840	89%	
NEPOOL	NEPOOL_2_NH	8426	NYPP	NYISO_11_NYK	8784	7.9	8784	100%	
NYPP	NYISO_1_NYA	8254	NYPP	NYISO_11_NYK	8784	22.2	6963	79%	
ONTARIO	IESO_15_G	8382	NYPP	NYISO_11_NYK	8784	25.4	6963	79%	
	PENELEC_2_MSA_DuBois_G			NYISO_11_NYK	8784	17.3	6963	79%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	FRCC	FPL_7_MSA_Miami_L	8784	11.0	5655	64%	
SPP	WERE 1 MSA Manhattan G	8771	SPP	OKGE 4 MSA OklahomaCity L	8783	23.3	8329	95%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	7519	10.2	5564	63%	
VACAR	CPLE_1_MSA_Durham_G	7843	PJM	VAP_33_MSA_DC_L	8784	7.4	7574	86%	



# Regional corridors with the highest price differentials one corridor per sink market area

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
SPP	AEPW_9_MSA_MountPleasant_	7676	ENTERGY	EES_5_MSA_NewOrleans_G	8784	8.3	8744	100%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	FRCC	FPL_7_MSA_Miami_L	8784	11.0	5655	64%	
MAPP	NPPD_4_GEN_Gentleman_G	8760	MAPP	OPPD_5_MSA_Omaha_L	8784	16.7	8367	95%	
MISO	OTP_9_GEN_BigStone_G	8784	MISO	XEL_3_MSA_Minneapolis_G	4672	23.0	7840	89%	
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_9_NWKST	8784	17.3	6972	79%	
ONTARIO	IESO_15_G	8382	NYPP	NYISO_11_NYK	8784	25.4	6963	79%	
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_8_MSA_DC-VA-MD_L	8784	16.7	8036	91%	
				SOCO_10_MSA_Albany-					
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	Valdosta_L	7519	10.2	5564	63%	
				OKGE_4_MSA_OklahomaCity					
SPP	WERE_1_MSA_Manhattan_G	8771	SPP	_L	8783	23.3	8329	95%	
MISO	BREC_3_County_Webster_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	13.6	7759	88%	
PJM	AEP_8_GEN_Amos01_G	8783	VACAR	DUK_4_MSA_Greenville_L	6816	5.2	5209	59%	



# Regional corridors with the highest U90 one corridor per source market area

Source Hub Ir	formation		Sink Hub Info	rmation		Congestion Indicators			
		Source			Sink		U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
ENTERGY	EES_10_MSA_Vicksburg_G	8088	ENTERGY	EES_5_MSA_NewOrleans_G	8784	5.2	6331	72%	
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_3_MSA_Miami_L	8784	4.2	5135	58%	
MAPP	MEC_3_MSA_DesMoines_G	7991	MAPP	OPPD_5_MSA_Omaha_L	8784	1.0	2138	24%	
MISO	ITC_3_MSA_Detroit_G	8784	MISO	FE_5_MSA_Cleveland_L	6473	3.5	8397	96%	
NEPOOL	NEPOOL_2_NH	8426	NYPP	NYISO_11_NYK	8784	7.9	8784	100%	
NYPP	NYISO_1_NYA	8254	NYPP	NYISO_10_NYJ	8784	20.7	8784	100%	
ONTARIO	IESO_15_G	8382	NYPP	NYISO_10_NYJ	8784	23.9	8784	100%	
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	8.9	8698	99%	
SOUTHERN	SOCO_26_MSA_Macon_G	8784	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.2	7077	81%	
	AEPW_9_MSA_MountPleasant_			EES_5_MSA_NewOrleans_G	8784	8.3			
	TVA_4_MSA_Clarksville_G			TVA_5_MSA_Nashville_L	8541	5.8	5984	68%	
VACAR	CPLE_1_MSA_Durham_G	7843	PJM	VAP_33_MSA_DC_L	8784	7.4	7574	86%	



# Regional corridors with the highest U90 one corridor per sink market area

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion Indicators			
		Source			Price	U90			
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
SPP	AEPW_9_MSA_MountPleasant_	7676	ENTERGY	EES_5_MSA_NewOrleans_G	8784	8.3	8744	100%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	FRCC	FPL_7_MSA_Miami_L	8784	10.7	5894	67%	
MAPP	NPPD_4_GEN_Gentleman_G	8760	MAPP	OPPD_5_MSA_Omaha_L	8784	16.7	8367	95%	
ONTARIO	IESO_7_G	8784	MISO	ITC_2_MSA_Detroit_L	8541	1.3	8724	99%	
NEPOOL	NEPOOL_2_NH	8426	NEPOOL	NEPOOL_9_NWKST	8784	3.0	8780	100%	
ONTARIO	IESO_15_G	8382	NYPP	NYISO_10_NYJ	8784	23.9	8784	100%	
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	8.9	8698	99%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_17_MSA_Mobile_G	6709	5.8	5844	67%	
SPP	WERE_1_MSA_Manhattan_G	8771	SPP	AEPW_1_MSA_Tulsa_G	7434	5.5	8634	98%	
MISO	BREC_3_County_Webster_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	13.6	7759	88%	
PJM	AEP_8_GEN_Amos01_G	8783	VACAR	DUK_4_MSA_Greenville_L	6816	5.2	5209	59%	



### **Identifying Most Limiting Flowgates**

- In the process of computing congestion indices for corridors, we conducted a comprehensive analysis of flowgates that are:
  - Most limiting for that corridor (determine the ATC)
  - Second most limiting
  - Third most limiting
- We placed this information for each scenario in a database structure
- The following examples demonstrate how this database could be used to assess which transmission constraints need to be resolved in order to reduce congestion within a given corridor and how to identify all corridors that will benefit from resolving congestion associated with a particular flowgate
- Further application of this analysis is demonstrated in Task 4



## Analysis of limiting flowgates for corridors with highest price differentials

Rank 1 – most limiting constraint, Rank 2 – second most limiting, Rank 3 – third most limiting only three most limiting flowgates are shown for each corridor

			Rank 1	Rank 2	Rank 3
From Hub	To Hub	Flowgate	Hours	Hours	Hours
EES_2_MSA_Batesville_G	OKGE_4_MSA_OklahomaCity_L	SPP111-SUMHE_BULSLD	3539	844	420
EES_2_MSA_Batesville_G	OKGE_4_MSA_OklahomaCity_L	SPP 57-PITSEMPITSUN	928	1691	936
EES_2_MSA_Batesville_G	OKGE_4_MSA_OklahomaCity_L	SPP 68-SILDIVNWSCIM	620	1510	2260
SEC_6_MSA_Palatka_G	FPL_7_MSA_Miami_L	CENTRAL-SOUTHEAST	4647	1981	955
SEC_6_MSA_Palatka_G	FPL_7_MSA_Miami_L	RICE 40477-RICE 404621	1064	1148	1816
SEC_6_MSA_Palatka_G	FPL_7_MSA_Miami_L	NORTHEAST-CENTRAL	363	2143	1624
NPPD_4_G	OPPD_5_MSA_Omaha_L	SPP 93-WNE_WKS	6468	1583	535
NPPD_4_G	OPPD_5_MSA_Omaha_L	1441 - Grand Island-Aurora 1	1518	3504	2492
NPPD_4_G	OPPD_5_MSA_Omaha_L	1502 - 70th & Bluff Xfm (flo	399	2567	3536
NEPOOL_2_NH	NYISO_11_NYK	North New England Scobie Low	5306	488	43
NEPOOL_2_NH	NYISO_11_NYK	CP10_12_1-tips, ReacBus-Dvnp	962	2240	2124
NEPOOL_2_NH	NYISO_11_NYK	2TRIP Norwalk H-Northport	217	826	1563
NYISO_1_NYA	NYISO_11_NYK	NFG7105 - ADIRONDACK - IMO	2615	785	23
NYISO_1_NYA	NYISO_11_NYK	NFG7010 - IMO - ADIRONDACK	1645	2203	547
NYISO_1_NYA	NYISO_11_NYK	CP10_12_1-tips, ReacBus-Dvnp	692	1430	1780
IESO_15_G	NYISO_11_NYK	NFG7105 - ADIRONDACK - IMO	2615	785	22
IESO_15_G	NYISO_11_NYK	NFG7010 - IMO - ADIRONDACK	1645	2202	543
IESO_15_G	NYISO_11_NYK	CP10_12_1-tips, ReacBus-Dvnp	690	1426	1725
PENELEC_2_MSA_DuBois_G	NYISO_11_NYK	NFG7105 - ADIRONDACK - IMO	2614	785	23
PENELEC_2_MSA_DuBois_G	NYISO_11_NYK	NFG7010 - IMO - ADIRONDACK	1647	2203	539
PENELEC_2_MSA_DuBois_G	NYISO_11_NYK	CP10_12_1-tips, ReacBus-Dvnp	700	1429	1743



## Analysis of limiting flowgates for corridors with highest price differentials (cont'd)

Rank 1 – most limiting constraint, Rank 2 – second most limiting, Rank 3 – third most limiting only three most limiting flowgates are show for each corridor

			Rank 1	Rank 2	Rank 3
From Hub	To Hub	Flowgate	Hours	Hours	Hours
SOCO_15_MSA_Birmingham_G	FPL_7_MSA_Miami_L	CENTRAL-SOUTHEAST	3288	1452	707
SOCO_15_MSA_Birmingham_G	FPL_7_MSA_Miami_L	FG 1519 8THALMAN 500 DUVAL 5	809	1611	1805
	FPL_7_MSA_Miami_L	FG 1518 8HATCH 500 DUVAL 500	0	252	1634
WERE_1_MSA_Manhattan_G	OKGE_4_MSA_OklahomaCity_L	FG 5196 SPS North - South	5740	940	322
WERE_1_MSA_Manhattan_G	OKGE_4_MSA_OklahomaCity_L	1-TRIPS,AUBURN 6-JEC 6- 1	1085	2508	1067
WERE_1_MSA_Manhattan_G	OKGE_4_MSA_OklahomaCity_L	SPP 26-ELPFARWICWDR	620	2019	1633
TVA_4_MSA_Clarksville_G	SOCO_10_L	1216 - Cumberland-Davidson 5	7126	1316	265
TVA_4_MSA_Clarksville_G	SOCO_10_L	1215 - Cumberland-Johnsonvil	250	7002	1091
TVA_4_MSA_Clarksville_G	SOCO_10_L	1-TRIPS,6MITCHEL-3MITCHLL- 1	76	90	3541
CPLE_1_MSA_Durham_G	VAP_33_MSA_DC_L	148 - Cloverdale-Lexington 5	2316	1207	682
CPLE_1_MSA_Durham_G	VAP_33_MSA_DC_L	APS South Interface	2080	1665	1097
CPLE_1_MSA_Durham_G	VAP_33_MSA_DC_L	FG 1720 Loudoun 500/230 out1	210	819	1479



### **Supporting Materials for Step 4**

Appendix 5 contains congestion indices by corridor by scenario



#### Conclusions

- CRA completed simulation of Eastern Interconnection for the purpose of quantifying the spread and magnitude of transmission congestion of that part of the US power grid
- On the basis of this analysis we identified the most critical and chronically congested elements (flowgates) in the Eastern Interconnection and quantified their impact on the system
- Next we identified critical nodes in Eastern Interconnection which are likely candidates for end markets for transmission corridors and identified candidate corridors. For each node, we computed several indicators of their importance. In addition, we collected GIS-based information for each node
- For each corridor we computed two indicators of corridor congestion – price differential and U90
- These data will be used in Task 7 of this project



			From					All-hrs	Binding
Constraints	From Area		Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
APS South Interface	VAP	AP	PJM	PJM	1	50	98	38	67
7 I/F MOSES SOUTH CLOSE HI	NYISO	NEPOOL		NEPOOL	2	73	44	30	102
INTERFACE= PJM - WESTERN	AP		PJM	PJM	3	60	101	100	177
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	4	84	74	34	73
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	5	38	35	32	145
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	6	92	130	78	106
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	7	153	168	62	38
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	8	52	80	2	5
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	9	49	43	45	168
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	10	68	40	1	12
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	8	15	18	141
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	12	78	61	5	25
1216 - Cumberland-Davidson 5	TVA	TVA	<b>TVAUTHOR</b>	TVAUTHOR	13	46	79	96	204
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	14	62	66	4	11
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHERN	15	102	70	111	235
FG 1376 Coly-Vignes for the	LAGN	EES	ENTERGY	ENTERGY	16	20	30	22	92
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	17	4	7	15	147
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	18	123	93	99	192
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	19	45	33	3	28
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	ENTERGY	ENTERGY	20	6	4	28	196
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	21	111	162	161	212
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	22	126	149	137	194
246 - Frankfort East-Tyrone	LGEE	LGEE	MISO	MISO	23	72	59	8	29
81 - Blue Lick-Bullitt Co. 1	LGEE	EKPC	MISO	MISO	24	129	127	11	7
7 I/F MOSES SOUTH CLOSE LO	NYISO	<b>NEPOOL</b>	NYPP	NEPOOL	25	27	18	71	241
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	26	95	81	49	117
NFG1314 - Little Gypsy-South	EES	EES	ENTERGY	ENTERGY	27	83	111	36	50
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	28	66	51	17	63
70 - Branchburg-Flagtown 230	PSEG	PSEG	PJM	PJM	29	34	37	47	195
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	30	43	45	39	152
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	31	19	53	82	224
North New England Scobie Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	32	18	16	88	291
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	33	206	147	19	8
11 I/F UPNY - SENY OPEN LO	PJM500	NYISO	PJM	NYPP	34	54	54	167	314
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	35	14	19	10	74

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008Base

			From					All-hrs	Binding
Constraints	From Area	To Area	Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	36	37	64	13	40
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	37	74	36	7	44
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	38	56	77	9	20
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	39	91	94	27	41
SPP118-STOMORLACNEO	SWPA	AECI	SPP	ENTERGY	40	93	82	25	39
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	41	12	12	95	297
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	42	69	50	35	126
7 I/F CENTRAL EAST LO	NYISO	NEPOOL	NYPP	NEPOOL	43	57	56	144	303
11 I/F UPNY - SENY CLOSE LO	PJM500	NYISO	PJM	NYPP	44	116	117	190	299
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERGY	ENTERGY	45	98	106	26	30
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	46	48	23	48	218
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	47	122	119	44	59
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	48	82	72	6	19
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	49	152	137	29	24
733 - Toledo Bend-Leesville	CELE	EES	SPP	ENTERGY	50	104	85	16	33
1-TRIPS,RIVER-N -GANNON - 1	TECO	TECO	FRCC	FRCC	51	128	91	50	100
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	52	209	215	31	2
1-TRIPS,5DAVSN 2-5GRASL T- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	53	158	112	65	101
1-TRIPS,AUBURN 6-JEC 6- 1	WERE	WERE	SPP	SPP	54	107	115	73	131
147 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	55	183	203	145	86
14 I/F WEST CENTRAL CLOSE H	PJM500	NYISO	PJM	NYPP	56	165	148	172	227
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	57	61	71	54	153
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	ENTERGY	58	110	62	23	55
FG 1324 WhiteBluff-Sheridan	EES	EES	ENTERGY	ENTERGY	59	164	144	148	214
14 I/F WEST CENTRAL CLOSE L	PJM500	NYISO	PJM	NYPP	60	144	97	174	296
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	61	159	120	33	35
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	62	225	169	133	164
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	63	44	29	12	78
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	64	162	298	176	22
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	65	108	88	14	32
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	66	39	52	53	178
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	67	5	3	120	321
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	68	99	223	192	135
East West Transfer West	IESO	IESO	ONTARIO	ONTARIO	69	67	47	64	202
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	70	25	20	40	203

			From					All-hrs	Binding
Constraints	From Area	To Area	Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	ENTERGY	ENTERGY	71	180	160	85	65
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERGY	ENTERGY	72	1	1	42	237
1456 - Buchannon Longwood In	IESO	IESO	ONTARIO	ONTARIO	73	200	150	208	264
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	ENTERGY	74	130	131	46	49
NFG3033 - Arpin Xformer+Arpi	ALTE	ALTE	MISO	MISO	75	174	143	68	64
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	76	184	108	60	84
930 - Hopkins CoBarkley 16	TVA	BREC	<b>TVAUTHOR</b>	MISO	77	139	109	57	80
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	78	30	41	56	198
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	79	2	2	127	327
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	80	47	32	24	91
FG 1519 8THALMAN 500 DUVAL 5	SOCO	FPL	SOUTHERN	FRCC	81	119	154	204	248
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	82	127	124	21	16
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	83	125	121	61	76
268 - Greenfield-Lakeview 13	FE	FE	MISO	MISO	84	172	116	55	77
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	85	58	38	41	169
SPP 90-FTCAL_S	OPPD	OPPD	MAPP	MAPP	86	154	102	101	175
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	87	247	187	37	9
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	88	7	5	76	294
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	89	145	87	59	133
1454 - IMO-NYIS	IESO	NYISO	ONTARIO	NYPP	90	151	84	146	286
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	91	117	76	43	88
SPP to MAIN Interface	AECI	AMRN	ENTERGY	MISO	92	239	159	138	182
1-TRIP MANOR-SAKRON BRUNNERI	PL	PL	PJM	PJM	93	207	247	117	17
1240 - Coal Creek Tap-Stanto	GRE	GRE	MISO	MISO	94	135	95	104	205
1194 - Smith XFM 345/138 Xfm	LGEE	LGEE	MISO	MISO	95	88	140	90	97
97 - Benton Harbor-Palisades	AEP	METC	PJM	MISO	96	293	242	199	96
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	97	232	189	69	31
1-TRIPS,5DAVAN 2-5GRASL T- 1	TVA	TVA	<b>TVAUTHOR</b>	TVAUTHOR	98	197	164	108	113
1348 - Erie West-Erie South	PENELEC	PENELE	PJM	PJM	99	178	132	119	188
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	100	124	73	52	144
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	<b>TVAUTHOR</b>	TVAUTHOR	103	113	107	66	110
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	NEPOOL	NEPOOL	104	10	10	92	295
New England North-South Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	105	140	96	206	312
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	106	161	114	70	121
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	109	100	68	20	43

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008Base

			From					All-hrs	Binding
Constraints	From Area	To Area	Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	110	21	22	79	246
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	111	22	24	81	247
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	112	53	6	177	326
NFG3263 - Nelson-Dixon B FLO	NI	NI	PJM	PJM	113	218	259	94	6
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	114	80	86	220	324
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	115	26	27	87	250
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	117	17	11	98	300
1-TRIPS,5J VIL 2-5DICKSON- 1	TVA	TVA		TVAUTHOR	119	106	134	86	104
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	123	89	146	93	85
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA		TVAUTHOR	124	133	138	89	108
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	125	205	218	84	15
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	126	185	126	74	107
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	129	51	21	75	249
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	130	136	92	97	193
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	136	120	122	72	103
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	137	15	9	67	255
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	138	155	113	63	89
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	141	233	211	58	10
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	144	70	13	203	332
650 - Seneca-Maple 138 (flo)	FE	FE	MISO	MISO	145	193	197	106	52
1-TRIPS,GARRISN4-GARRISN7- 1	WAPA	WAPA	MAPP	MAPP	148	160	99	80	161
1-TRIPS,TEC E 3-TECHILE3- 1	WERE	WERE	SPP	SPP	150	85	55	115	268
1197 - Green River Steel-Clo	LGEE	LGEE	MISO	MISO	151	81	173	112	90
1133 - Smith 345/138 Xfm (fl	LGEE	LGEE	MISO	MISO	153	63	166	131	159
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERGY	ENTERGY	154	31	26	83	244
861 - Center-Heskett 230	OTP	WAPA	MISO	MAPP	155	142	89	143	272
Actual:SPRBROOK-TREMONT	NYISO	NYISO	NYPP	NYPP	157	41	65	165	308
249 - ATC Flow South	WEC	WPS	MISO	MISO	158	121	67	118	240
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	159	109	49	51	176
664 - State Line-Wolf Lake 1	NIPS	NI	MISO	PJM	167	90	78	156	298
FG 1380 Batesville-Marks for	EES	EES	ENTERGY	ENTERGY	171	40	28	77	242
1TSPBKTRMT:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	175	11	57	168	313
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	177	59	31	103	285
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	187	32	39	160	319
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	203	114	60	258	342

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008Base

			From					All-hrs	Binding
Constraints	From Area	To Area	Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
1215 - Cumberland-Johnsonvil	TVA	TVA	<b>TVAUTHOR</b>	TVAUTHOR	212	71	327	309	215
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	215	118	75	129	265
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	216	77	184	128	111
Actual:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	219	16	14	158	331
Actual:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	220	24	25	159	325
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL			NEPOOL	223	96	48	205	329
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	ENTERGY	ENTERGY	228	101	83	139	279
W Rutland Tap - Blissvile 11	NEPOOL		NEPOOL	NEPOOL	234	13	8	195	339
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	235	316	294	91	1
Actual:RAINEY8W-VERNON-W	NYISO	NYISO	NYPP	NYPP	237	115	90	211	318
CP10_15_ASTE-WRG_HG A 1_Bas	NYISO	NYISO	NYPP	NYPP	238	29	100	184	302
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERGY	253	55	42	166	320
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERGY	ENTERGY	281	76	58	194	323
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	289	105	63	317	350
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	322	131	69	342	355
Actual:E179 ST-HG 4	NYISO	NYISO	NYPP	NYPP	332	33	338	304	187
Actual:E179 ST-HG 1	NYISO	NYISO	NYPP	NYPP	333	36	310	308	231
Actual:L SUCSPH-JAMAICA	NYISO	NYISO	NYPP	NYPP	338	87	46	326	354
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	345	28	17	348	358
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	357	3	180	356	356
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	360	65	34	358	360
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	364	9	364	364	364
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	365	23	366	365	365
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	366	35	365	366	366
1552 - MP-IMO_N	MP	IESO	MISO	ONTARIO	367	42	367	367	367
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	368	64	370	368	368
669 - S. Mahwah 1-Waldwick 3	PSEG	NYISO	PJM	NYPP	369	75	368	369	369
670 - S. Mahwah 2-Waldwick 3	PSEG	NYISO	PJM	NYPP	370	79	369	370	370
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	371	86	371	371	371
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	372	94	373	372	372
1074 - Smith-Hardin Co 345 (	LGEE	LGEE	MISO	MISO	373	97	372	373	373

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008HighFuel

								All-hrs	Binding
Constraints	From Area		From Market		CongRent		BindHrs	Price	Hrs Price
APS South Interface	VAP	AP	PJM	PJM	1	55	101	41	61
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	2	58	99	86	171
7 I/F MOSES SOUTH CLOSE HI	NYISO	<b>NEPOOL</b>	NYPP	NEPOOL	3	70	47	30	91
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	4	32	39	27	108
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	5	83	77	38	73
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	6	92	122	68	88
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	7	43	37	35	146
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	8	159	172	59	36
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	9	56	89	2	
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	10	78	58	5	25
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	7	15	16	129
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	12	63	40	1	11
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHERN	13	102	67	107	228
1216 - Cumberland-Davidson 5	TVA	TVA	TVAUTHOR	<b>TVAUTHOR</b>	14	51	84	91	199
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	15	124	91	96	185
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	16	69	68	4	12
70 - Branchburg-Flagtown 230	PSEG	PSEG	PJM	PJM	17	27	32	36	164
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	18	98	149	157	212
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	19	46	33	3	27
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	ENTERGY	ENTERGY	20	6	3	29	194
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	21	30	36	129	313
FG 1376 Coly-Vignes for the	LAGN	EES	ENTERGY	ENTERGY	22	20	30	25	103
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	23	87	81	46	89
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	24	3	7	23	162
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	25	130	150		191
81 - Blue Lick-Bullitt Co. 1	LGEE	EKPC	MISO	MISO	26	129	123		
246 - Frankfort East-Tyrone	LGEE	LGEE	MISO	MISO	27	77	63	10	29
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	28	16	42	64	217
NFG1314 - Little Gypsy-South	EES	EES	ENTERGY	ENTERGY	29	85	110	39	49
7 I/F MOSES SOUTH CLOSE LO	NYISO	<b>NEPOOL</b>	NYPP	NEPOOL	30	25	19	75	246
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	31	62	73	165	306
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	32	66	54	17	59
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	33	49	48	44	154
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	34	200	143	15	7
North New England Scobie Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	35	13	12	77	283

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008HighFuel

								All-hrs	Binding
Constraints	From Area	To Area	From Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	36	73	38	6	40
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	37	52	51	132	300
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	38	17	20	11	70
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	39	38	66	14	39
SPP118-STOMORLACNEO	SWPA	AECI	SPP	ENTERGY	40	95	87	21	38
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	41	57	78	7	23
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	42	68	52	34	96
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	43	45	22	48	211
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	44	11	10	98	297
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	45	93	98	28	42
14 I/F WEST CENTRAL CLOSE H	NYISO	NYISO	NYPP	NYPP	46	142	134	146	221
733 - Toledo Bend-Leesville	CELE	EES	SPP	ENTERGY	47	88	74	12	33
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	48	144	126	26	24
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	49	131	124	45	53
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	50	96	82	9	22
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERGY	ENTERGY	51	111	118	31	31
14 I/F WEST CENTRAL CLOSE L	NYISO	NYISO	NYPP	NYPP	52	121	80	166	298
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	53	209	217	32	2
1-TRIPS,RIVER-N -GANNON - 1	TECO	TECO	FRCC	FRCC	54	128	92	57	109
FG 1324 WhiteBluff-Sheridan	EES	EES	ENTERGY	ENTERGY	55	172	145	142	206
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	ENTERGY	56	108	62	20	54
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	57	61	72	53	151
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	58	157	121	33	35
1-TRIPS,AUBURN 6-JEC 6- 1	WERE	WERE	SPP	SPP	59	106	114	82	135
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	60	222	169	133	161
1-TRIPS,5DAVSN 2-5GRASL T- 1	TVA	TVA		TVAUTHOR	61	164	112	70	111
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	62	21	18	37	186
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	63	50	29	13	75
147 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	64	181	202	160	116
930 - Hopkins CoBarkley 16	TVA	BREC	TVAUTHOR	MISO	65	137	104	49	72
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	ENTERGY	66	132	129	43	44
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	67	5	4	115	322
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	68	41	53	56	180
New England North-South Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	69	101	61	162	312
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	70	120	113	51	69

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008HighFuel

								All-hrs	Binding
Constraints	From Area		From Market		CongRent		BindHrs	Price	Hrs Price
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	71	115		18	
NFG3033 - Arpin Xformer+Arpi	ALTE	ALTE	MISO	MISO	72	176		61	
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	ENTERGY	ENTERGY	73	183	161	81	58
East West Transfer West	IESO	IESO	ONTARIO	ONTARIO	74	67		60	203
1456 - Buchannon Longwood In	IESO	IESO	ONTARIO	ONTARIO	75	187	151	210	248
FG 1519 8THALMAN 500 DUVAL 5	SOCO	FPL	SOUTHERN		76	117	148	197	240
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	77	2		125	335
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	78	36	43	55	198
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	79	100	241	212	119
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	80	64	45	40	150
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERGY	ENTERGY	81	1	1	47	236
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	82	169	304	194	
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	83	133		19	
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	84	53		24	
SPP 90-FTCAL_S	OPPD	OPPD	MAPP	MAPP	85	150	105	101	175
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	86	9	5	72	288
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	87	31			
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	88	251			
1240 - Coal Creek Tap-Stanto	GRE	GRE	MISO	MISO	89	138	96	104	202
1-TRIP MANOR-SAKRON BRUNNERI	PL	PL	PJM	PJM	90	198	254		
2TRIP Norwalk H-Northport	NEPOOL		NEPOOL	NEPOOL	91	10			
268 - Greenfield-Lakeview 13	FE	FE	MISO	MISO	92	180	117		
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	93	205			101
SPP to MAIN Interface	AECI	AMRN	ENTERGY	MISO	94	241			
SPP 18-DOLXFRELDXFR	CELE	CELE	SPP	SPP	95	145		127	
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	96	158			
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	97	231			
97 - Benton Harbor-Palisades	AEP	METC	PJM	MISO	98	288			
1454 - IMO-NYIS	IESO	NYISO	ONTARIO	NYPP	99	152			292
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	100	125	83	50	97
1194 - Smith XFM 345/138 Xfm	LGEE	LGEE	MISO	MISO	101	97	142	95	90
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	104	168			
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	105	119	76		
650 - Seneca-Maple 138 (flo)	FE	FE	MISO	MISO	107	177	176	79	
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	111	202	209	66	13

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008HighFuel

								All-hrs	Binding
Constraints	From Area	To Area	From Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
NFG3263 - Nelson-Dixon B FLO	NI	NI	PJM	PJM	112	219	267	92	5
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	113	19	13	94	295
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	114	74	137	80	86
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	116	103	69	22	51
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	117	165	115	78	128
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	118	22	24	89	252
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	120	24	27	90	254
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	122	47	21	74	239
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	123	80	86	230	332
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	125	28		97	255
1-TRIP EDISON-MDWRD PBRG-TRN	PSEG	PSEG	PJM	PJM	127	114	95	110	216
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	128	127	130	93	124
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	134	18	11	63	241
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	135	233	203	54	10
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	137	186	132	88	117
1197 - Green River Steel-Clo	LGEE	LGEE	MISO	MISO	139	84	163	106	84
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	140	156	111	65	
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	142	122	128	84	112
7 I/F CENTRAL EAST HI	NYISO	NYISO	NYPP	NYPP	146	91	200	263	296
1-TRIPS,GARRISN4-GARRISN7- 1	WAPA	WAPA	MAPP	MAPP	149	161	100	83	163
249 - ATC Flow South	WEC	WPS	MISO	MISO	153	123	71	114	234
1-TRIPS,TEC E 3-TECHILE3- 1	WERE	WERE	SPP	SPP	154	86	55	122	269
861 - Center-Heskett 230	OTP	WAPA	MISO	MAPP	155	146	97	145	244
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	158	89	16	184	343
Actual:SPRBROOK-TREMONT	NYISO	NYISO	NYPP	NYPP	159	34			
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERGY	ENTERGY	161	35			250
1133 - Smith 345/138 Xfm (fl	LGEE	LGEE	MISO	MISO	162	72			
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	164	112			189
1TSPBKTRMT:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	167	12	57	158	310
NFG1399 - Wyatt-Parnell 115k	EES	EES	ENTERGY	ENTERGY	169	281	229	100	15
1TGOWNGOTN:GOWANUSS-GOTHLS	NYISO	NYISO	NYPP	NYPP	173	151	93	222	324
FG 1380 Batesville-Marks for	EES	EES	ENTERGY	ENTERGY	176	42	26	85	249
664 - State Line-Wolf Lake 1	NIPS	NI	MISO	PJM	177	94	88	176	301
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	184	60	31	103	262
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	191	40	46	169	321

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008HighFuel

								All-hrs	Binding
Constraints	From Area		From Market	To Market	CongRent		BindHrs	Price	Hrs Price
W Rutland Tap - Blissvile 11	NEPOOL		NEPOOL	NEPOOL	205	15	_		
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	206	76			
1215 - Cumberland-Johnsonvil	TVA	TVA	TVAUTHOR		207	71	328		
Actual:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	210	14			
Actual:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	211	23			328
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL		NEPOOL	NEPOOL	217	105			331
CP10_15_ASTE-WRG_HG A 1_Bas	NYISO	NYISO	NYPP	NYPP	226	33			
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	227	126			
Actual:RAINEY8W-VERNON-W	NYISO	NYISO	NYPP	NYPP	230	82			
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	232	118			
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	ENTERGY	ENTERGY	235	99			
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	244	318	305	99	1
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERGY	257	54	41	171	325
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERGY	ENTERGY	285	75			
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	298	110			
Actual:E179 ST-HG 4	NYISO	NYISO	NYPP	NYPP	314	39	299	275	
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	322	143			
Actual:E179 ST-HG 1	NYISO	NYISO	NYPP	NYPP	326	44	284	299	231
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	347	29	17	349	360
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	357	4	196	356	355
Actual:L SUCSPH-JAMAICA	NYISO	NYISO	NYPP	NYPP	361	81	44	359	363
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	364	65	35	363	365
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	370	8		370	370
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	371	26	371	371	371
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	372	37	372	372	372
1552 - MP-IMO_N	MP	IESO	MISO	ONTARIO	373	48	373	373	373
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	374	59	374	374	374
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	375	79	375	375	375
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	376	90	376	376	376

			From					All-hrs	Binding
Constraints	From Area		Market		CongRent		BindHrs	Price	Hrs Price
APS South Interface	VAP	AP	PJM	PJM	1	37		54	
INTERFACE= PJM - WESTERN	AP		PJM	PJM	2	71		96	
7 I/F MOSES SOUTH CLOSE HI	NYISO	<b>NEPOOL</b>	NYPP	NEPOOL	3	76	46	33	120
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	4	90		36	
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	5	33	30	29	142
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	6	41		1	4
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	7	32		38	
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	8	144	152	69	52
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	9	3		9	107
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	10	45	56	2	7
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	4	7	19	154
FG 1376 Coly-Vignes for the	LAGN	EES	ENTERGY	ENTERGY	12	23	32	13	72
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	13	105	142	115	143
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	14	89	55	3	15
7 I/F MOSES SOUTH CLOSE LO	NYISO	NEPOOL	NYPP	NEPOOL	15	25	22	60	222
1216 - Cumberland-Davidson 5	TVA	TVA	<b>TVAUTHOR</b>		16	53		111	204
246 - Frankfort East-Tyrone	LGEE	LGEE	MISO	MISO	17	56	58	7	22
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI		ENTERGY	18	7	_	30	
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	19	52		4	23
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	20	34	37	145	310
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	21	139	114	113	184
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	22	65	81	154	294
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	23	84		57	131
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	24	66		10	
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	25	68		17	56
North New England Scobie Low	NEPOOL	NEPOOL		NEPOOL	26	11	13	79	
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	27	94		22	21
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	28	72	100	6	
NFG1314 - Little Gypsy-South	EES	EES	ENTERGY	ENTERGY	29	91	126	49	
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	30	43		48	
81 - Blue Lick-Bullitt Co. 1	LGEE	EKPC	MISO	MISO	31	155		18	
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHERN		132		158	
70 - Branchburg-Flagtown 230	PSEG	PSEG	PJM	PJM	33	50		61	194
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	34	19		89	
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	35	29	61	14	38

			From					All-hrs	Binding
Constraints	From Area	To Area	Market		CongRent		BindHrs	Price	Hrs Price
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	36	152	163	175	213
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	37	73			16
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	38	12	20	11	100
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERGY	ENTERGY	39	98	103	21	27
1-TRIPS,5DAVSN 2-5GRASL T- 1	TVA	TVA	<b>TVAUTHOR</b>		40	140			
1-TRIPS,RIVER-N -GANNON - 1	TECO	TECO	FRCC	FRCC	41	123	89	43	78
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	42	129	184	204	219
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	43	61	69	149	296
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	44	217	154	25	10
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	45	103	93	46	
268 - Greenfield-Lakeview 13	FE	FE	MISO	MISO	46	104	64	27	62
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	47	205	213	23	1
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	48	80	68	8	17
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	49	93	39	15	55
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	50	64	48	40	144
SPP118-STOMORLACNEO	SWPA	AECI	SPP	ENTERGY	51	99	102	28	45
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	52	86	50	31	111
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	53	160	92	37	63
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	54	28	71	119	257
1-TRIPS,AUBURN 6-JEC 6- 1	WERE	WERE	SPP	SPP	55	112	121	80	126
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	<b>TVAUTHOR</b>	<b>TVAUTHOR</b>	56	63	62	32	80
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	57	58	28	76	224
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERGY	ENTERGY	58	1	1	35	215
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	59	214	167	138	167
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	60	70	78	59	150
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	61	159	267	173	36
178 - Crete-E. Frankfort 345	NI	NI	PJM	PJM	62	128	134	130	190
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	63	48	25	16	99
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	ENTERGY	64	119	74	24	53
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA	<b>TVAUTHOR</b>	<b>TVAUTHOR</b>	65	79	84	39	87
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	ENTERGY	ENTERGY	66	177	160	86	60
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	ENTERGY	67	136	136	50	42
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	68	5	3	125	318
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	69	110	72	34	67
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	70	47	27	20	105

			From					All-hrs	Binding
Constraints	From Area		Market		CongRent		BindHrs	Price	Hrs Price
5ROBBINS 161-5SANTEET 161- 1	DUK	TVA	VACAR	TVAUTHOR		185		51	
East West Transfer West	IESO	IESO	ONTARIO	ONTARIO	72	67			
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	73			44	
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	74	167		41	
50 - Axton 765/138 Xfm (flo)	AEP	AEP	PJM	PJM	75	181			
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	76	51			
1-TRIPS,5DAVAN 2-5GRASL T- 1	TVA	TVA		TVAUTHOR	77	183		92	
1-TRIP MANOR-SAKRON BRUNNERI	PL	PL	PJM	PJM	78	220	234		
1456 - Buchannon Longwood In	IESO	IESO	ONTARIO	ONTARIO	79	204			
1194 - Smith XFM 345/138 Xfm	LGEE	LGEE	MISO	MISO	80	55	119	72	114
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	81	2	2	133	324
1-TRIPS,5J VIL 2-5DICKSON- 1	TVA	TVA	<b>TVAUTHOR</b>		82	78		56	
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	83	59	36	45	
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	84	39	44	66	198
489 - Nelson-Electric Jct. 3	NI	NI	PJM	PJM	85	108	191	159	152
SPP to MAIN Interface	AECI	AMRN	ENTERGY	MISO	86	229	151	135	180
NFG3033 - Arpin Xformer+Arpi	ALTE	ALTE	MISO	MISO	87	156	131	85	
1-TRIPS,6MCINTOS-6WMCNTH1- 1	SOCO	SOCO	SOUTHERN	SOUTHERN	88	236	174	157	177
1454 - IMO-NYIS	IESO	NYISO	ONTARIO	NYPP	89	158	90	148	282
SPP 90-FTCAL_S	OPPD	OPPD	MAPP	MAPP	90	170	123	107	163
733 - Toledo Bend-Leesville	CELE	EES	SPP	ENTERGY	91	164	132	42	
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	92	30	6	120	316
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	93	17	19	64	231
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	94	18	21	65	232
CRYSTAL RIVER-SOUTH	FPC	FPC	FRCC	FRCC	95	157	168	196	242
FG 1324 WhiteBluff-Sheridan	EES	EES	ENTERGY	ENTERGY	96	184	165	190	225
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	97	109	233	222	149
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	98	121	125	26	
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	99	21	23	71	233
14 I/F WEST CENTRAL CLOSE L	NYISO	NYISO	NYPP	NYPP	100	191	135	212	301
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	101	249	193	53	12
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	NEPOOL	NEPOOL	102	10	11	87	291
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	104	107	73	12	28
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	105	9	8	97	303
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	107	172	122	70	102

			From					All-hrs	Binding
Constraints	From Area		Market		CongRent		BindHrs	Price	Hrs Price
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	108	130	79	58	136
1204 - Farr RDJ-Tippy 138 (f	METC		MISO	MISO	109	182	124	62	90
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	110	227	194	84	30
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	111	137	104	47	68
1-TRIPS,5OGLETHR-5WIDCRK2- 2	TVA	TVA	TVAUTHOR	<b>TVAUTHOR</b>	112	124	138	81	91
1133 - Smith 345/138 Xfm (fl	LGEE	LGEE	MISO	MISO	114	35	130	102	140
5NANTAHA 161-5ROBBINS 161-1	DUK	DUK	VACAR	VACAR	117	216	182	83	37
NFG3263 - Nelson-Dixon B FLO	NI	NI	PJM	PJM	118	188	248	91	5
New England East-West Low	NEPOOL	NEPOOL		NEPOOL	119	131	98	211	315
1-TRIPS,14REID 5-14DAVIS5- 1	BREC	BREC	MISO	MISO	122	126	176	98	
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE		MISO	MISO	123	146	143	99	116
1-TRIPS,FT MEADE-FT MEADE- 1	FPC		FRCC	FRCC	124	120	128	67	76
Actual:GOWNUS1R-GRENWOOD	NYISO		NYPP	NYPP	125	88	144	94	110
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	127	138	94	93	179
650 - Seneca-Maple 138 (flo)	FE	FE	MISO	MISO	129	197	201	100	34
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	131	14	10	112	309
1-TRIPS,TEC E 3-TECHILE3- 1	WERE	WERE	SPP	SPP	135	82	57	108	248
249 - ATC Flow South	WEC	WPS	MISO	MISO	136	115	63	105	217
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	137	20	12	73	278
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	138	57	26	95	284
FG 1516 6PURVIS 230 5PURVIS	SMEPA	SOCO	SOUTHERN	SOUTHERN	139	125	118	90	148
1-TRIPS,GARRISN4-GARRISN7- 1	WAPA	WAPA	MAPP	MAPP	142	165	105	82	146
751 - Warren-Falconer 115 (f	PENELEC	NYISO	PJM	NYPP	144	169	112	74	129
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERGY	ENTERGY	145	44	31	78	227
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	146	83	91	241	331
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	149	111	54	52	145
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	155	240	217	77	11
861 - Center-Heskett 230	OTP	WAPA	MISO	MAPP	159	133	83	150	288
FG 1380 Batesville-Marks for	EES	EES	ENTERGY	ENTERGY	162	54	29	75	223
1197 - Green River Steel-Clo	LGEE		MISO	MISO	163	87	175	127	130
Actual:SPRBROOK-TREMONT	NYISO	NYISO	NYPP	NYPP	166	49	66	174	312
664 - State Line-Wolf Lake 1	NIPS		MISO	PJM	178	101	96	170	
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	179	114	14	213	342
1TSPBKTRMT:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	180	13	59	172	313
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	181	62	33	106	287

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2008LowFuel

			From					All-hrs	Binding
Constraints	From Area	To Area	Market	To Market	CongRent	U90	BindHrs	Price	Hrs Price
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	192	38	40	167	317
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	206	118	82	124	243
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	ENTERGY	ENTERGY	214	102	88	132	264
Actual:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	218	27	24	164	322
Actual:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	220	16	15	165	327
Actual:RAINEY8W-VERNON-W	NYISO	NYISO	NYPP	NYPP	223	106	77	194	314
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	NEPOOL	NEPOOL	224	15	9	186	338
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	NEPOOL	NEPOOL	226	100	47	200	328
CP10_15_ASTE-WRG_HG A 1_Bas	NYISO	NYISO	NYPP	NYPP	229	31	99	178	300
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	230	320	304	88	2
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERGY	263	75	51	183	321
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	265	95	52	298	348
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	266	116	65	302	347
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	286	77	224	210	155
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERGY	ENTERGY	297	85	67	218	325
Actual:E179 ST-HG 4	NYISO	NYISO	NYPP	NYPP	315	40	326	286	178
Actual:E179 ST-HG 1	NYISO	NYISO	NYPP	NYPP	322	42	300	301	226
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	331	26	17	338	355
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	333	143	80	347	354
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	344	69	272	334	323
Actual:L SUCSPH-JAMAICA	NYISO	NYISO	NYPP	NYPP	353	81	41	348	358
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	354	6	183	352	353
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	359	74	34	358	361
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	363	8	286	363	363
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	364	24	285	364	364
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	365	36	282	365	365
1552 - MP-IMO_N	MP	IESO	MISO	ONTARIO	366	46	281	366	366
1074 - Smith-Hardin Co 345 (	LGEE	LGEE	MISO	MISO	367	60	280	367	367
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	368	92	278	368	368
1215 - Cumberland-Johnsonvil	TVA	TVA	<b>TVAUTHOR</b>	TVAUTHOR	369	96	276	369	369
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	370	97	274	370	370

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	1	70	67	27	70
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	2	1	1	3	35
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	3	4	4	1	7
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	4	54	65	86	194
APS South Interface	VAP	AP	PJM	PJM	5	43	102	57	107
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	6	31	41	4	19
7 I/F MOSES SOUTH CLOSE HI	NYISO		NYPP	NEPOOL	7	73	48	37	130
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	8	9	11	2	15
1TRIP Leeds-Pleasant Val HI		NYISO	NYPP	NYPP	9	37	40	45	175
726 - Turkey Hill-S. Bellevi	IP	IP	MISO	MISO	10	14	36	6	25
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	11	44	81	5	6
SPP 93-WNE_WKS		NPPD	MAPP	MAPP	12	10	15	12	91
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	13	15	14	20	146
1100 - Trimble CoClifty Cr	OVEC	LGEE	PJM	MISO	14	47	46	49	170
FG 1376 Coly-Vignes for the		EES	<b>ENTERG</b>		15	28	34	17	90
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	16	146	163	85	57
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	17	68	50	7	18
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	18	149	117	11	8
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	19	96	132	104	159
FN/FS INT	IESO	IESO		ONTARIO		120	80	69	161
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	21	66	85	8	10
849 - C33 (DOE)-Grahamville	DOE	LGEE	TVAUTH	MISO	22	76	96	19	22
NFG1314 - Little Gypsy-South	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	23	56	103	36	58
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	<b>ENTERG</b>	<b>ENTERG</b>		8	7	35	192
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHE	25	60	72	123	256
7 I/F MOSES SOUTH CLOSE LO	NYISO	NEPOOL		<b>NEPOOL</b>	26	33	31	75	217
East West Transfer West	IESO	IESO		ONTARIO		6	6	21	158
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	28	86	55	13	29
North New England Scobie Low			NEPOOL		29	21	19	82	273
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	30	17	20	14	89
426 - McGulpin-Straits 138 #	METC	WEC	MISO	MISO	31	53	44	10	32
NFG6079 - TEST_MHEB_OTDF_Sha	MP	MP	MISO	MISO	32	42	35	34	168
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	33	5	5	9	73
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	34	75	88	87	184
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	35	124	136	159	220

			From	То				All-hrs	Binding
Constraints	From Area			Market	CongRent	U90	BindHrs	Price	Hrs Price
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP		MISO	36	50	53	40	128
FG 1518 8HATCH 500 DUVAL 500	SOCO	FPL	SOUTHE	FRCC	37	67	87	132	258
249 - ATC Flow South	WEC	WPS	MISO	MISO	38	58	43	23	104
1509 - Bain-Kenosha 138 (flo	WEC	WEC		MISO	39	81	78	30	69
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	40	141	86	31	63
SPP111-SUMHE_BULSLD	SWPA	EES		<b>ENTERG</b>		71	45	15	56
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERG			84	92	24	34
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	43	89	90	61	134
CLAN/CLAS INT	IESO	IESO		ONTARIO	44	132	97	96	189
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	45	35	28	101	280
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	<b>ENTERG</b>	46	112	112	33	38
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	47	52	69	151	283
876 - Cranberry Loop 115kV	WPS	WPS		MISO	48	125	170	32	9
1-TRIPS,01BLCCKO-01HATFLD- 1	AP	AP	PJM	PJM	49	82	213	156	123
500 - Newton-Effingham 138 (	AMRN	AMRN	MISO	MISO	50	104	118	46	50
5ROBBINS 161-5SANTEET 161- 1	DUK	TVA	VACAR	TVAUTH	51	123	93	39	65
SPP118-STOMORLACNEO	SWPA	AECI	SPP	<b>ENTERG</b>	52	106	111	41	52
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	53	148	138	99	145
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	54	131	122	66	80
FG 1379 Grimes-Mt Zion for t	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	55	2	2	38	206
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	56	162	126	43	37
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	57	119	133	206	281
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA		TVAUTH		78	70	44	98
FG 1324 WhiteBluff-Sheridan	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	59	172	139	145	203
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>		140	135	80	83
1162 - Dune Acres-Michigan C	NIPS	NIPS		MISO	61	118	148	42	20
733 - Toledo Bend-Leesville	CELE	EES		<b>ENTERG</b>	62	122	106	29	43
ONT Hydro to Michigan	IESO	ITC	ONTARIC	MISO	63	151	99	129	230
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	64	72	73	204	301
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	65	46	59	22	61
1348 - Erie West-Erie South	PENELEC	PENELE	PJM	PJM	66	143	113	93	167
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	67	85	47	90	215
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	68	100	241	178	118
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	69	178	150	173	231
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	70	128	77	54	133

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
319 - Hoytdale-Maple 138 (fl	FE	FE	MISO	MISO	71	155	175	73	23
SPP 67-SEMXFRSEMXFR	OKGE	OKGE	SPP	SPP	72	343	264	92	4
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	73	138	124	77	99
1038 - Reasnor-Des Moines 16	ALTW	MEC	MISO	MAPP	74	251	180	51	13
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA	TVAUTH	TVAUTH	75	97	94	53	101
1-TRIPS,16PEGE -16THOMPS- 2	IPL	IPL	MISO	MISO	76	136	202	130	72
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	77	129	89	25	41
147 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	78	173	231	162	86
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	79	34	12	105	288
New Freedm 500-230 XFormer	PJM500	PSEG	PJM	PJM	80	195	162	116	122
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	81	49	71	52	136
1593 - Webster-Walton 230 (f	CIN	CIN	MISO	MISO	82	186	156	78	60
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	83	137	98	55	106
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	84	109	84	47	88
97 - Benton Harbor-Palisades	AEP	METC	PJM	MISO	85	241	200	168	157
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	86	214	165	28	11
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	87	153	160	56	21
14 I/F WEST CENTRAL CLOSE H	NYISO	NYISO	NYPP	NYPP	88	194	249	185	114
1-TRIPS,6W.RINGO-3W.RINGG- 1	TVA	TVA	TVAUTH	TVAUTH	89	95	101	58	110
1-TRIPS,6PERRY R-3PERRY R- 2	SCPSA	SCPSA	VACAR	VACAR	90	161	129	79	87
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	91	110	114	26	24
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	92	25	22	65	226
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	93	36	30	59	205
1-TRIPS,CHARLOTE-HARDCHAR- 1	FPL	FPC	FRCC	FRCC	94	165	128	128	191
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	95	108	60	48	132
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	96	87	82	50	109
1-TRIPS,6BLUFFTN-3BLUFFTN- 2	SCPSA	SCPSA	VACAR	VACAR	97	166	134	84	93
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	98	88	63	16	36
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	99	182	224	259	236
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	100	22	26	70	225
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	101	23	27	72	227
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	103	39	32	62	208
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	104	24	29	76	228
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	106	64	54	81	197
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	107	157	110	63	95

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	108	7	8	147	306
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	115	150	120	88	142
New England North-South Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	116	94	66	180	300
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	117	40	121	165	268
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	118	3	3	154	315
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	120	223	183	91	39
New England East-West Low	NEPOOL		NEPOOL		126	127	91	203	296
2TRIP Norwalk H-Northport	NEPOOL		NEPOOL		127	18	17	121	291
1-TRIPS,10NEWTNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	129	154	153	98	116
1-TRIPS,5OGLETHR-5WIDCRK2- 2	TVA	TVA	TVAUTH	<b>TVAUTH</b>	130	135	147	95	111
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	131	233	211	18	1
FG 1308 Dodson-Danville_Hart	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	132	27	24	64	221
5NANTAHA 161-5ROBBINS 161- 1	DUK	DUK	VACAR	VACAR	133	188	177	94	55
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	135	12	10	118	294
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	136	134	95	89	180
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	137	274	218	83	16
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	138	114	100	222	302
FG 1380 Batesville-Marks for	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	140	20	18	60	219
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	142	41	33	67	210
901 - Galesburg 161/138 Xfm	MEC	ΙΡ	MAPP	MISO	146	187	173	74	27
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	147	26	25	71	232
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	148	101	16	164	311
823LYLES 3LEXNGT	SCEG	SCPSA	VACAR	VACAR	157	77	56	97	223
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	158	57	155	127	149
1-TRIPS,3CAMPFLD-3GTWN S - 1	SCPSA	SCPSA	VACAR	VACAR	159	69	62	103	233
1-TRIPS,3GTWN S -3IPCOPMP- 1	SCPSA	SCPSA	VACAR	VACAR	162	74	64	106	229
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	163	30	23	136	298
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	164	107	51	68	188
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	167	45	37	108	279
1-TRIPS,3CAMPFLD-3IPCOPMP-99	SCPSA	SCPSA	VACAR	VACAR	176	92	74	117	234
NFG1399 - Wyatt-Parnell 115k	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	181	226	199	100	40
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	185	59	39	134	287
1-TRIPS,3JAXISW -3R.BRAS -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	186	111	83	122	237
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	211	48	38	256	329
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	212	79	76	126	255

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011Base

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	225	91	52	193	305
1-TRIPS,SPRBROOK-W 49 ST - 2	NYISO	NYISO	NYPP	NYPP	229	105	79	238	309
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	<b>NEPOOL</b>	NEPOOL	NEPOOL	231	61	49	200	308
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	NEPOOL	NEPOOL	235	32	21	187	321
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERG	242	83	58	160	289
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	243	115	75	283	330
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERG	ENTERG	276	98	68	183	299
Minong - Stone Lake 138kV	XEL	MP	MISO	MISO	301	99	154	276	303
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	306	13	9	307	340
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	310	65	42	326	341
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	334	19	13	328	344
690 - St. Clair 345/230 Xfm	ITC	ITC	MISO	MISO	336	103	57	342	346
1T Jamaica-ValSt SprBrk-EGC	NYISO	NYISO	NYPP	NYPP	341	55	233	339	333
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	345	90	61	344	347
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	348	63	115	348	348
1-TRIPS,DOLHILL6-DOLHILL7- 1	NYISO	NYISO	NYPP	NYPP	349	16	351	350	350
NFG7007 - WESTCHESTER - LONG	NYISO	NYISO	NYPP	NYPP	350	11	350	351	351
FG 5204 SphWmcSumEmc	NYISO	NYISO	NYPP	NYPP	351	29	352	352	352
ONTARIO-NEW YORK ST LAW INT	NYISO	NYISO	NYPP	NYPP	352	38	353	353	353
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	353	51	354	354	354
1-TRIP CEDARGROVE-ROSELAND	NYISO	NYISO	NYPP	NYPP	354	62	355	355	355
FG 1519 8THALMAN 500 DUVAL 5	NYISO	NYISO	NYPP	NYPP	355	80	356	356	356
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	356	93	357	357	357

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011HighFuel

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	1	38	62	67	175
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	2	66	70	28	62
APS South Interface	VAP	AP	PJM	PJM	3	33	99	48	74
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	4	63	31	3	22
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	5	68	5	1	10
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	6	37	35	31	135
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	7	29	1	4	49
7 I/F MOSES SOUTH CLOSE HI	NYISO	NEPOOL	NYPP	NEPOOL	8	57	52	36	97
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	9	41	10	2	15
726 - Turkey Hill-S. Bellevi	IP	IP	MISO	MISO	10	347	34	5	29
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	11	36	84	6	5
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	12	76	126	79	99
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	13	3	19	18	121
1100 - Trimble CoClifty Cr	OVEC	LGEE	PJM	MISO	14	354	49	43	147
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	15	125	168	70	44
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	16	59	50	7	17
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHE	17	348	69	102	214
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	18	177	109	8	8
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	19	4	16	17	104
FG 1376 Coly-Vignes for the	LAGN	EES	<b>ENTERG</b>	<b>ENTERG</b>	20	17	37	27	102
NFG1314 - Little Gypsy-South	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	21	67	93	33	51
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO		188	81	65	149
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	<b>ENTERG</b>	<b>ENTERG</b>	23	52	7	35	181
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	24	130	59	11	32
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	25	103	130	130	194
East West Transfer West	IESO	IESO		ONTARIO		50	6	19	152
849 - C33 (DOE)-Grahamville	DOE	LGEE	TVAUTH		27	294	120	26	27
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	28	49	78	9	16
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	29	30	72	44	93
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	30	140	92	16	28
FG 1518 8HATCH 500 DUVAL 500	SOCO	FPL	SOUTHE	FRCC	31	349	82	112	218
7 I/F MOSES SOUTH CLOSE LO	NYISO	NEPOOL		NEPOOL	32	23	28	80	226
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	33	5	23	13	82
North New England Scobie Low	NEPOOL		NEPOOL		34	14	15	82	267
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	35	53	76	29	56

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011HighFuel

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
249 - ATC Flow South	WEC	WPS	MISO	MISO	36	101	42	22	84
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	37	45	57	41	106
NFG6079 - TEST_MHEB_OTDF_Sha	MP	MP	MISO	MISO	38	172	36	40	162
426 - McGulpin-Straits 138 #	METC	WEC	MISO	MISO	39	346	48	12	41
733 - Toledo Bend-Leesville	CELE	EES	SPP	<b>ENTERG</b>	40	88	64	14	33
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	41	25	97	94	172
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	<b>ENTERG</b>	42	82	46	15	54
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	43	34	4	10	87
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	44	46	56	138	285
1-TRIPS,01BLCCKO-01HATFLD- 1	AP	AP	PJM	PJM	45	166	212	142	77
NFG1350 - North Crowley-Scot	LAGN	EES	<b>ENTERG</b>	<b>ENTERG</b>	46	80	102	30	37
97 - Benton Harbor-Palisades	AEP	METC	PJM	MISO	47	239	178	127	89
SPP118-STOMORLACNEO	SWPA	AECI	SPP	<b>ENTERG</b>	48	93	108	32	38
CLAN/CLAS INT	IESO	IESO	ONTARIO	ONTARIO	49	286	96	98	180
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	50	44	67	176	300
CENTRAL-SOUTHEAST	FPL	FPL	FRCC	FRCC	51	112	136	143	196
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	52	74	132	93	100
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	53	108	103	186	286
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	54	181	176	34	6
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	55	12	26	104	277
INTERFACE= PJM - EASTERN	PJM500	PJM500	PJM	PJM	56	84	193	200	206
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	<b>ENTERG</b>	57	104	106	37	43
ONT Hydro to Michigan	IESO	ITC	ONTARIO	MISO	58	297	88	108	208
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	59	106	137	57	52
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	60	155	105	52	69
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	61	15	74	117	223
319 - Hoytdale-Maple 138 (fl	FE	FE	MISO	MISO	62	137	171	53	25
FG 1324 WhiteBluff-Sheridan	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	63	135	143	137	187
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	64	184	152	39	20
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	65	10	47	71	207
500 - Newton-Effingham 138 (	AMRN	AMRN	MISO	MISO	66	224	131	49	42
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	67	55	122	58	73
1593 - Webster-Walton 230 (f	CIN	CIN	MISO	MISO	68	219	147	61	47
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	69	97	12	46	202
1348 - Erie West-Erie South	PENELEC	PENELE	PJM	PJM	70	144	119	89	136

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011HighFuel

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	71	54	8	96	281
1-TRIPS,10NEATNV-14COLE 5- 1	SIGE	BREC	MISO	MISO	72	100	94	55	88
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	73	154	139	78	83
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	74	32	85	21	36
New England North-South Low	NEPOOL	<b>NEPOOL</b>	NEPOOL	<b>NEPOOL</b>	75	114	44	153	297
1162 - Dune Acres-Michigan C		NIPS	MISO	MISO	76	51	165	45	23
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	77	62	53	24	72
14 I/F WEST CENTRAL CLOSE L	NYISO	NYISO	NYPP	NYPP	78	132	98	172	279
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERG		79	1	2	50	221
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	80	79	240	179	94
1038 - Reasnor-Des Moines 16	ALTW	MEC	MISO	MAPP	81	277	183	47	13
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	82	107	110	20	24
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	83	20	25	51	192
1441 - Grand Island-Aurora 1		NPPD	MAPP	MAPP	84	70	60	38	92
147 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	85	153	205	161	125
14 I/F WEST CENTRAL CLOSE H	NYISO	NYISO	NYPP	NYPP	86	151	155	182	220
New Freedm 500-230 XFormer	PJM500	PSEG	PJM	PJM	87	355	160	111	108
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	88	27	86	54	91
1-TRIPS,16PEGE -16THOMPS- 2	IPL	ΙΡL	MISO	MISO	89	146	211	133	71
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	90	48	40	56	189
SPP 67-SEMXFRSEMXFR	OKGE	OKGE	SPP	SPP	91	344	276	100	7
5ROBBINS 161-5SANTEET 161- 1	DUK	TVA	VACAR	TVAUTH	92	204	123	64	79
1-TRIPS,CHARLOTE-HARDCHAR- 1	FPL	FPC	FRCC	FRCC	93	165	133	128	186
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	94	24	65	74	184
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	95	193	175	42	12
1240 - Coal Creek Tap-Stanto	GRE	GRE	MISO	MISO	96	111	101	106	182
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	97	141	95	66	118
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	98	190	177	73	34
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	TVAUTH	TVAUTH	99	94	100	68	115
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	100	136	307	197	55
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	101	95	87	60	103
1-TRIPS,10NEWTNV-14COLE 5- 1		BREC	MISO	MISO	103	134	148	86	78
1-TRIPS,6PERRY R-3PERRY R- 2	SCPSA	SCPSA	VACAR	VACAR	105	179	135	97	105
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	106	56	13	156	311
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	107	98	80	62	133

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011HighFuel

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	108	78	66	23	58
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	109	6	9	101	289
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	110	121	141	99	107
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	112	119	116	83	134
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	114	18	29	85	235
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	116	2	3	162	315
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	117	19	30	88	234
2TRIP Norwalk H-Northport	NEPOOL	<b>NEPOOL</b>	NEPOOL	NEPOOL	119	39	17	113	293
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	120	22	32	91	237
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	122	150	115	76	109
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	123	64	91	204	303
1-TRIPS,6W.RINGO-3W.RINGG- 1	TVA	TVA	TVAUTH	TVAUTH	124	227	121	84	128
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA	TVAUTH	TVAUTH	127	113	128	95	120
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	128	85	104	87	154
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	130	96	182	59	21
SPP 81-TUPTUPVALPIT	SWPA	WFEC	SPP	SPP	131	241	158	75	59
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	133	262	204	25	1
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	135	42	33	63	204
FG 1308 Dodson-Danville_Hart	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	137	26	24	72	227
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	139	81	236	116	30
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	140	201	226	92	19
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	141	11	21	115	292
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	144	87	146	110	145
FG 1380 Batesville-Marks for	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	150	28	18	69	228
NFG1399 - Wyatt-Parnell 115k	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	154	238	190	90	35
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	160	102	27	81	231
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	165	35	38	123	288
7 I/F CENTRAL EAST HI	NYISO	NYISO	NYPP	NYPP	167	90	210	271	283
823LYLES 3LEXNGT	SCEG	SCPSA	VACAR	VACAR	171	157	63	118	229
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	176	89	54	77	200
1-TRIPS,3CAMPFLD-3GTWN S - 1	SCPSA	SCPSA	VACAR	VACAR	179	156	71	121	233
1-TRIPS,3GTWN S -3IPCOPMP- 1	SCPSA	SCPSA	VACAR	VACAR	180	161	73	124	232
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	182	133	43	126	284
1-TRIPS,5J VIL 2-5DICKSON- 1	TVA	TVA	TVAUTH	TVAUTH	185	92	185	144	116
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	186	40	14	201	325

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011HighFuel

			From	То				All-hrs	Binding
Constraints	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
1-TRIPS,3CAMPFLD-3IPCOPMP-99	SCPSA	SCPSA	VACAR	VACAR	190	182	79	129	238
1-TRIPS,3JAXISW -3R.BRAS -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	200	124	89	140	239
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	<b>NEPOOL</b>	NEPOOL	NEPOOL	204	69	51	173	304
W Rutland Tap - Blissvile 11	NEPOOL	<b>NEPOOL</b>	NEPOOL	NEPOOL	216	13	22	169	313
1-TRIPS,SPRBROOK-W 49 ST - 2	NYISO	NYISO	NYPP	NYPP	218	91	83	212	308
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	220	77	75	132	250
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	224	99	39	256	332
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	226	72	68	188	305
1197 - Green River Steel-Clo	LGEE	LGEE	MISO	MISO	227	65	234	190	143
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERG	228	43	45	151	295
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	235	86	77	279	329
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	<b>ENTERG</b>	ENTERG	242	61	58	160	296
664 - State Line-Wolf Lake 1	NIPS	NI	MISO	PJM	247	71	164	243	291
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	297	118	41	316	343
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO		21	11	301	342
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	314	142	20	314	344
Actual:SPRBROOK-TREMONT	NYISO	NYISO	NYPP	NYPP	316	47	189	325	331
Actual:L SUCSPH-JAMAICA	NYISO	NYISO	NYPP	NYPP	324	58	127	318	337
690 - St. Clair 345/230 Xfm	ITC	ITC	MISO	MISO	330	173	61	340	346
PVSC 138-NORTH AV 138- 1	PSEG	PSEG	PJM	PJM	343	264	90	343	347
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	347	60	55	347	350
CP10_15_ASTE-WRG_HG A 1_Bas	NYISO	NYISO	NYPP	NYPP	348	73	201	348	348
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	351	75	117	350	351
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	352	7	280	353	353
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	353	8	274	354	354
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	354	9	277	355	355
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO		355	16	275	356	356
1552 - MP-IMO_N	MP	IESO	MISO	ONTARIO		31	267	357	357
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	357	83	268	358	358

			From	То				All-hrs	Binding
Constraint	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	1	1	1	3	33
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	2	3	4	1	9
APS South Interface	VAP	AP	PJM	PJM	3	40	90	58	126
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	4	62	61	90	200
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	5	77	78	40	74
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	6	11	14	2	14
7 I/F MOSES SOUTH CLOSE HI				NEPOOL	7	67	50	41	128
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	8	32	47	5	18
SPP 93-WNE_WKS	NPPD	NPPD		MAPP	9	10	12	10	75
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO		NYPP	10	36	39	48	168
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	6	7	19	140
FG 1376 Coly-Vignes for the	LAGN	EES	<b>ENTERG</b>		12	25	31	15	70
726 - Turkey Hill-S. Bellevi	IP	IP		MISO	13	13	37	8	29
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	14	41	82	7	10
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	15	142	150	79	56
1100 - Trimble CoClifty Cr	OVEC	LGEE	PJM	MISO	16	49	44	50	163
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	17	83	94	4	4
849 - C33 (DOE)-Grahamville	DOE	LGEE	TVAUTH	MISO	18	48	71	16	25
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	19	119	81	72	151
7 I/F MOSES SOUTH CLOSE LO	NYISO	<b>NEPOOL</b>	NYPP	<b>NEPOOL</b>	20	33	35	69	204
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	21	158	126	11	8
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	22	106	138	121	160
East West Transfer West	IESO	IESO	ONTARIC	ONTARIO	23	7	6	22	148
NFG1314 - Little Gypsy-South	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	24	55	106	43	46
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	<b>ENTERG</b>	<b>ENTERG</b>	25	9	15	44	190
North New England Scobie Low	NEPOOL	NEPOOL	NEPOOL	<b>NEPOOL</b>	26	24	20	77	264
426 - McGulpin-Straits 138 #	METC	WEC	MISO	MISO	27	54	42	9	27
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	28	57	76	81	178
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	29	5	5	6	59
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	30	91	56	17	36
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHE	31	82	83	139	271
NFG6079 - TEST_MHEB_OTDF_Sha	MP	MP	MISO	MISO	32	44	34	33	147
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	33	105	68	12	21
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	34	129	75	27	54
5ROBBINS 161-5SANTEET 161- 1	DUK	TVA	VACAR	TVAUTH	35	86	57	21	44

			From	То				All-hrs	Binding
Constraint	From Area		Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
249 - ATC Flow South	WEC	WPS	MISO	MISO	36	56	40	23	101
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	37	50	52	42	124
NFG1350 - North Crowley-Scot	LAGN	EES	<b>ENTERG</b>	<b>ENTERG</b>	38	85	91	24	32
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	39	80	79	36	61
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	<b>ENTERG</b>	40	72	45	14	47
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	41	22	25	20	114
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	TVAUTH	TVAUTH	42	47	51	26	78
500 - Newton-Effingham 138 (	AMRN	AMRN	MISO	MISO	43	76	102	39	52
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	44	37	29	103	278
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	<b>ENTERG</b>	45	114	112	35	31
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	46	74	48	38	116
FG 1379 Grimes-Mt Zion for t	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	47	2	2	29	191
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	48	102	122	187	279
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	49	140	148	180	259
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	50	109	160	32	12
CLAN/CLAS INT	IESO	IESO	ONTARIO	ONTARIO	51	132	103	99	187
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	52	87	118	28	23
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	53	58	77	158	280
1-TRIPS,5OGLATHR-5WIDCRK2- 1	TVA	TVA		TVAUTH	54	63	64	37	87
FG 1518 8HATCH 500 DUVAL 500	SOCO	FPL	SOUTHE	FRCC	55	90	105	160	273
SPP 57-PITSEMPITSUN	AEPW	OKGE	SPP	SPP	56	84	98	108	195
1-TRIPS,01BLCCKO-01HATFLD- 1	AP	AP	PJM	PJM	57	71	210	166	135
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	58	136	137	75	73
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	59	61	69	196	303
1-TRIPS,16PEGE -16THOMPS- 2	IPL	IPL	MISO	MISO	60	127	188	123	71
1-TRIPS,6W.RINGO-3W.RINGG- 1	TVA	TVA		TVAUTH	61	94	89	46	84
SPP 67-SEMXFRSEMXFR	OKGE	OKGE	SPP	SPP	62	345	270	80	3
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	63	134	116	78	112
1-TRIPS,6PERRY R-3PERRY R- 2	SCPSA	SCPSA	VACAR	VACAR	64	148	128	70	68
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	65	138	100	51	91
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	66	60	96	25	30
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	67	125	127	96	143
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	68	81	46	89	249
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	69	151	124	73	80
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	70	152	140	127	166

			From	То				All-hrs	Binding
Constraint	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
1270 - Newton-Casey 345 (flo	AMRN	AMRN	MISO	MISO	71	139	163	141	162
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	72	113	93	45	72
New Freedm 500-230 XFormer	PJM500	PSEG	PJM	PJM	73	218	174	118	93
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERG	<b>ENTERG</b>	74	17	23	56	213
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	ENTERG	75	19	24	57	212
1038 - Reasnor-Des Moines 16	ALTW	MEC	MISO	MAPP	76	238	171	53	16
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	77	21	26	63	216
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	78	88	88	47	90
SPP118-STOMORLACNEO	SWPA	AECI		<b>ENTERG</b>	79	124	130	64	58
1-TRIPS,CHARLOTE-HARDCHAR- 1	FPL	FPC	FRCC	FRCC	80	160	129	126	182
50 - Axton 765/138 Xfm (flo)	AEP	AEP	PJM	PJM	81	167	202	133	69
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	82	31	27	55	201
FG 1324 WhiteBluff-Sheridan	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	83	177	142	164	236
5NANTAHA 161-5ROBBINS 161-1	DUK	DUK	VACAR	VACAR	84	146	145	61	38
1348 - Erie West-Erie South	PENELEC	PENELEC	PJM	PJM	85	144	110	104	175
460 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	86	145	283	182	51
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	87	92	65	13	24
335 - Kammer 765/500 Xfm (fl	AP	AEP	PJM	PJM	88	257	212	165	133
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	89	222	178	34	7
1-TRIPS,5OGLETHR-5WIDCRK2- 2	TVA	TVA	TVAUTH	TVAUTH	90	104	115	66	94
733 - Toledo Bend-Leesville	CELE	EES	SPP	<b>ENTERG</b>	91	137	117	49	48
319 - Hoytdale-Maple 138 (fl	FE	FE	MISO	MISO	92	150	192	82	20
CRYSTAL RIVER-SOUTH	FPC	FPC	FRCC	FRCC	93	165	213	177	156
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	94	45	73	60	139
CAPE CANAVERAL-INDIAN RIVER	FPL	OUC	FRCC	FRCC	95	135	104	112	192
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	96	130	99	31	45
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	97	161	109	59	86
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	98	101	251	208	131
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	99	147	134	87	119
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	100	120	113	30	28
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	101	39	30	68	210
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	102	26	21	76	260
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	105	8	9	150	309
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	106	27	11	128	296
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	107	121	62	54	138

			From	То				All-hrs	Binding
Constraint	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	112	4	3	159	317
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	113	68	55	86	206
New England East-West Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	117	123	85	194	295
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	119	227	209	18	1
406 - Marengo-Pleasant Valle	NI	NI	PJM	PJM	121	163	179	92	49
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	122	209	183	88	42
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERG	<b>ENTERG</b>	124	28	28	62	208
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	NEPOOL	NEPOOL	125	18	17	124	292
New England North-South Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	126	118	86	201	298
1-TRIPS,5J VIL 2-5DICKSON- 1	TVA	TVA	TVAUTH			128	149	85	83
1199 - New Hardinsburg 161/1	BREC	BREC	MISO	MISO	129	224	175	91	53
FG 1380 Batesville-Marks for	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	132	23	18	52	205
268 - Greenfield-Lakeview 13	FE	FE		MISO	133	169	139	97	127
Actual:GRENWOOD-VERNON-E	NYISO	NYISO		NYPP	134	131	92	84	176
SPP 26-ELPFARWICWDR	WERE	WERE	SPP	SPP	136	175	196	93	34
737 - Turkey River-Cassville	ALTW	DPC	MISO	MISO	137	185	151	95	105
901 - Galesburg 161/138 Xfm	MEC	ΙΡ	MAPP	MISO	140	155	153	67	37
Petersburg 345/138 Xfm E	IPL	ΙΡL	MISO	MISO	141	278	218	83	17
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	142	15	10	131	299
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	143	35	32	71	215
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	144	112	95	226	306
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	145	46	36	74	221
823LYLES 3LEXNGT	SCEG	SCPSA	VACAR	VACAR	150	73	58	94	209
1-TRIPS,3CAMPFLD-3GTWN S - 1	SCPSA	SCPSA	VACAR	VACAR	157	75	66	98	217
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	158	108	53	65	171
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	159	65	158	125	141
1-TRIPS,3GTWN S -3IPCOPMP- 1	SCPSA	SCPSA	VACAR	VACAR	161	79	72	100	214
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	166	43	33	107	277
1-TRIPS,3CAMPFLD-3IPCOPMP-99	SCPSA	SCPSA	VACAR	VACAR	172	100	87	115	218
1-TRIPS,3JAXISW -3R.BRAS -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	173	103	80	109	219
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	178	29	22	143	304
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	182	59	38	136	289
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	183	42	159	246	287
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	190	116	16	212	327
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	192	69	74	116	243

Appendix 1 SortedFlowgatesAll Revised 7-12-06.xls 2011LowFuel

			From	То				All-hrs	Binding
Constraint	From Area	To Area	Market	Market	CongRent	U90	BindHrs	Price	Hrs Price
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	NEPOOL	NEPOOL	225	66	49	198	310
1-TRIPS,SPRBROOK-W 49 ST - 2	NYISO	NYISO	NYPP	NYPP	228	97	84	233	312
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	229	96	54	204	308
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	NEPOOL	NEPOOL	236	30	19	191	322
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	237	107	67	275	329
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERG	253	95	59	170	291
NFG7005 - ADIRONDACK - ISONE	NEPOOL	NYISO	NEPOOL	NYPP	257	110	97	235	307
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	263	51	41	291	333
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	<b>ENTERG</b>	<b>ENTERG</b>	277	99	70	195	302
Minong - Stone Lake 138kV	XEL	MP	MISO	MISO	295	98	141	260	305
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	305	12	8	306	338
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	318	78	43	329	341
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	330	20	13	328	343
690 - St. Clair 345/230 Xfm	ITC	ITC	MISO	MISO	332	115	60	339	345
1T Jamaica-ValSt SprBrk-EGC	NYISO	NYISO	NYPP	NYPP	338	53	241	334	331
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	344	89	63	342	347
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	348	64	121	348	348
NFG7007 - WESTCHESTER - LONG	NYISO	NYISO	NYPP	NYPP	349	14	263	349	350
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	350	16	262	350	351
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	351	34	260	351	352
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	352	38	259	352	353
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	353	52	256	353	354
1-TRIP CEDARGROVE-ROSELAND	PSEG	PSEG	PJM	PJM	354	70	255	354	355
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	355	93	253	355	356

								T. ( . ) O	T. ( . )	D		
		Number	Number of		Gen	Load	Total Weight	Total Gen Weight in	Total Load Weight in	Percent Total	Percent Gen	Percent Load
Market	AREA	of Hubs	Clusters	Total Weight	Weight	Weight	in Hubs	Hubs	Hubs	Weight	Weight	Weight
ENTERGY	AECI	4	10	8,245	4,190	4,055	4,743	2,270	2,472	57.52%	52.65%	60.97%
ENTERGY	CWLD	1	9	301	-,150	301	48	2,210	48	15.95%	0.00%	15.95%
ENTERGY	DENL	1	9	293	14	279	81	_	81	27.47%	100.00%	28.85%
ENTERGY	DERS	1	1	143	75	68	143	75	68	100.00%	100.00%	100.00%
ENTERGY	EES	9	10	68,561	39,819	28,743	67,181	38,894	28,287	97.99%	97.92%	98.42%
ENTERGY	LAGN	1	10	3,427	2,349	1.078	2,342	2.179	163	68.32%	92.24%	15.09%
FRCC	FMP	1	8	299	137	162	167	137	30	56.06%	100.00%	18.81%
FRCC	FPC	4	10	21,255	10.286	10.969	15.060	7.791	7.269	70.85%	72.91%	66.27%
FRCC	FPL	4	10	45,594	23,197	22,397	42,621	22,424	20,197	93.48%	97.34%	90.18%
FRCC	FTP	1	7	261	142	119	171	142	29	65.34%	100.00%	24.09%
FRCC	GVL	1	10	1,052	549	503	536	423	113	50.91%	69.00%	22.41%
FRCC	HST	1	1	78	-	78	78	-	78	100.00%	0.00%	100.00%
FRCC	JEA	1	10	6,521	3,628	2,893	2,787	1,605	1,182	42.74%	37.06%	40.85%
FRCC	KEY	1	1	949	811	138	949	811	138	100.00%	100.00%	100.00%
FRCC	KIS	1	10	722	421	302	411	358	53	56.85%	62.30%	17.54%
FRCC	LAK	1	10	1,991	1,331	660	895	777	118	44.95%	65.65%	17.87%
FRCC	LWU	1	1	287	205	82	287	205	82	100.00%	100.00%	100.00%
FRCC	NSB	1	1	566	480	86	566	480	86	100.00%	100.00%	100.00%
FRCC	OUC	1	10	3.021	1.785	1,236	960	887	73	31.77%	57.27%	5.88%
FRCC	RCU	1	8	195	-	195	38	-	38	19.42%	0.00%	19.42%
FRCC	SEC	1	7	2,381	2,125	256	1,316	1,316	-	55.26%	70.19%	0.00%
FRCC	STK	1	1	17	- '-	17	17	-	17	100.00%	0.00%	100.00%
FRCC	TAL	1	10	1,258	652	606	507	295	211	40.27%	52.76%	34.88%
FRCC	TECO	2	10	10,282	6,266	4,016	6,007	3,499	2,507	58.42%	59.05%	62.43%
MAPP	MEC	1	10	11,569	6,115	5,454	5,049	3,115	1,933	43.64%	56.07%	35.45%
MAPP	MPW	1	7	418	253	165	201	151	50	47.98%	59.68%	30.04%
MAPP	NPPD	3	10	7,789	4,648	3,142	5,387	3,281	2,106	69.15%	69.83%	67.02%
MAPP	OPPD	1	10	4,679	2,187	2,492	2,102	416	1,686	44.92%	16.38%	67.65%
MAPP	WAPA	1	10	11,077	7,970	3,107	3,173	2,360	813	28.65%	27.90%	26.18%
MISO	ALTE	1	10	7,294	4,475	2,819	2,198	1,574	624	30.14%	31.82%	22.15%
MISO	ALTW	1	10	9,085	4,563	4,522	2,084	980	1,103	22.93%	26.09%	24.39%
MISO	AMRN	2	15	26,931	13,766	13,165	12,445	5,170	7,275	46.21%	37.76%	55.26%
MISO	BREC	1	10	3,437	1,810	1,627	1,915	1,355	560	55.71%	74.86%	34.41%
MISO	CILC	1	10	2,314	1,152	1,162	1,266	756	510	54.71%	65.51%	43.90%
MISO	CIN	5	8	28,328	14,333	13,995	26,347	13,359	12,988	93.01%	94.12%	92.80%
MISO	CWLP	1	10	1,106	620	486	527	300	227	47.68%	48.74%	46.77%
MISO	DPC	1	10	2,037	1,071	966	939	601	338	46.09%	54.42%	34.98%
MISO	EEI	1	3	1,382	1,292	90	543	507	36	39.29%	38.73%	39.91%
MISO	EKPC	1	10	4,730	2,519	2,211	1,861	1,396	465	39.34%	47.39%	21.02%
MISO	FE	7	10	27,315	13,246	14,070	23,640	11,176	12,464	86.54%	84.92%	88.59%
MISO	GRE	1	10	4,522	2,944	1,578	1,383	272	1,111	30.59%	11.01%	70.42%
MISO	HE	1	10	1,943	1,399	544	1,120	1,000	120	57.61%	70.75%	21.97%
MISO	IP	2	10	10,119	5,535	4,584	5,697	4,058	1,639	56.30%	62.44%	35.75%
MISO	IPL	3	10	6,325	3,250	3,074	4,872	2,457	2,414	77.03%	71.97%	78.53%
MISO	ITC	4	10	24,902	11,876	13,026	21,373	9,775	11,598	85.83%	82.52%	89.04%
MISO	LES	1	10	1,248	438	810	463	249	214	37.10%	55.71%	26.41%
MISO	LGEE	4	10	15,948	8,250	7,698	8,717	3,613	5,103	54.66%	50.57%	66.30%
MISO	METC	3	10	22,996	12,480	10,516	16,969	10,172	6,796	73.79%	79.26%	64.63%

									<u> </u>			
											_	
		Number	Number		Gen	Load	Tatal Mainlet	Total Gen	Total Load	Percent Total	Percent Gen	Percent Load
Market	AREA	of Hubs	of Clusters	Total Weight	Weight	Weight	Total Weight in Hubs	Weight in Hubs	Weight in Hubs	Weight	Weight	Weight
MISO	MGE	1	10	1,252	438	813	769	366	403	61.41%	82.95%	49.51%
MISO	MIPU	1	10	4,340	2,418	1,922	1.800	1,249	551	41.46%	51.57%	28.64%
MISO	MP	1	10	3,813	2,410	1,679	1,333	508	824	34.96%	40.69%	49.11%
MISO	NIPS	1	10	6.883	3.436	3.447	4.573	2.880	1.693	66.44%	73.01%	49.11%
MISO	OTP	2	10	3,352	1,457	1,895	1,941	1,166	775	57.92%	86.51%	40.91%
MISO	SIGE	1	10	3,441	1,478	1,963	909	135	774	26.41%	10.49%	39.42%
MISO	SIPC	1	10	675	412	263	465	412	53	68.84%	100.00%	20.03%
MISO	SMMPA	1	10	697	309	388	193	111	82	27.77%	41.83%	21.28%
MISO	SUNC	1	10	1,815	1,462	353	956	840	116	52.67%	54.38%	32.80%
MISO	UPPC	1	10	223	53	169	77	2	75	34.63%	48.75%	44.20%
MISO	WEC	3		15,435	8.048	7,387	12,423	6,645	5.777	80.48%	84.80%	78.21%
MISO	WEPL	1	10	948	372	576	261	137	124	27.48%	36.83%	21.45%
MISO	WPS	1	10	5,753	3,084	2,669	1,003	399	604	17.43%	29.84%	22.63%
MISO	XEL	1	10	19,501	9,287	10,215	17,489	9.867	7,622	89.68%	79.07%	74.62%
NEPOOL	CT	1	10	8.164	4.244	3,920	8.164	4.244	3.920	100.00%	100.00%	100.00%
NEPOOL	ME	1	1	5,824	3,301	2,522	5,824	3,301	2,522	100.00%	100.00%	100.00%
NEPOOL	NEBOS	1	1	8,306	2,401	5,904	8,306	2,401	5,904	100.00%	100.00%	100.00%
NEPOOL	NH	1	1	6,653	4,032	2,621	6,653	4,032	2,621	100.00%	100.00%	100.00%
NEPOOL	NWKST	1	1	2,293	769	1,524	1,908	385	1,524	83.23%	100.00%	100.00%
NEPOOL	RI	1	1	4,004	1,801	2,203	4,004	1,801	2,203	100.00%	100.00%	100.00%
NEPOOL	SEMA	1	1	12,790	8,812	3,978	10,056	6,078	3,978	78.62%	100.00%	100.00%
NEPOOL	SWCT	1	1	6,702	4,853	1,850	4,276	2,426	1,850	63.80%	100.00%	100.00%
NEPOOL	VT	1	1	1.962	772	1.190	1,962	772	1,190	100.00%	100.00%	100.00%
NEPOOL	WCMA	1	1	7,412	3,995	3,417	7,412	3,995	3,417	100.00%	100.00%	100.00%
NYISO	NYA	1	1	7,366	4,866	2,500	7,366	4,866	2,500	100.00%	100.00%	100.00%
NYISO	NYB	1	1	2,402	643	1,759	2,402	643	1,759	100.00%	100.00%	100.00%
NYISO	NYC	1	1	9.199	6,542	2.657	9,199	6.542	2.657	100.00%	100.00%	100.00%
NYISO	NYD	1	1	1,860	1,180	681	1,860	1,180	681	100.00%	100.00%	100.00%
NYISO	NYE	1	1	1,872	963	909	1,872	963	909	100.00%	100.00%	100.00%
NYISO	NYF	1	1	5,858	3,875	1,983	5,858	3,875	1,983	100.00%	100.00%	100.00%
NYISO	NYG	1	1	5,482	3,288	2,195	5,482	3,288	2,195	100.00%	100.00%	100.00%
NYISO	NYH	1	1	2,991	2,018	973	2,991	2,018	973	100.00%	100.00%	100.00%
NYISO	NYI	1	1	1,478	2	1,476	1,478	2	1,476	100.00%	100.00%	100.00%
NYISO	NYJ	1	1	21,924	10,432	11,493	21,924	10.432	11,493	100.00%	100.00%	100.00%
NYISO	NYK	1	1	10,584	5,295	5,289	10,584	5,295	5,289	100.00%	100.00%	100.00%
ONTARIO	IESO	6	15	55,383	29,028	26,355	40,644	20,278	20,366	73.39%	76.59%	77.28%
PJM	AE	1	10	4,025	1,259	2,766	913	77	836	22.68%	41.75%	30.22%
PJM	AEP	5	10	53,942	29,431	24,511	48,967	26,920	22,048	90.78%	92.12%	89.95%
PJM	AP	4	10	18,638	9,954	8,684	13,159	6,938	6,221	70.60%	70.01%	71.64%
PJM	BGE	5	10	10,924	3,943	6,981	9,660	3,564	6,096	88.43%	89.48%	87.32%
PJM	DLCO	2	10	6,246	3,441	2,805	2,303	1,644	659	36.88%	46.88%	23.51%
PJM	DP&L	1	10	7,692	3,528	4,164	3,164	1,399	1,765	41.13%	39.18%	42.39%
PJM	DPL	2	8	7,684	4,076	3,608	6,545	3,892	2,652	85.17%	95.23%	73.52%
PJM	JCPL	2	10	10,378	4,090	6,288	5,734	1,207	4,527	55.25%	28.36%	71.99%
PJM	METED	1	10	5,962	3,240	2,722	1,714	860	854	28.75%	26.18%	31.39%
PJM	NI	7	20	49,112	26,012	23,100	43,316	22,612	20,704	88.20%	88.51%	89.63%
PJM	OVEC	1	4	3,727	3,692	35	1,490	1,480	10	39.98%	41.29%	28.57%
PJM	PECO	3	10	16,871	8,401	8,470	8,072	3,944	4,128	47.84%	48.03%	48.74%

Task 2. Appendix 2: Summary of Cluster Analysis

					I	ı	l		l			
Market	AREA	Number of Hubs	Number of Clusters	Total Weight	Gen Weight	Load Weight	Total Weight	Total Gen Weight in Hubs	Total Load Weight in Hubs	Percent Total Weight	Percent Gen Weight	Percent Load Weight
PJM	PENELEC	1	10		4,800	2,792	3,811	2,615	1,196	50.20%	53.52%	42.84%
PJM	PEPCO	5			6,090	6,660	8.229	3,493	4,736	64.54%	58.80%	71.12%
PJM	PJM500	6			16,286	0,000	13,776	13,776	4,730	84.59%	86.62%	0.00%
PJM	PL	3	_	-,	8,311	6,864	5,121	2,788	2.333	33.75%	34.58%	33.99%
PJM	PSEG	4			8,328	10,682	16,423	7,089	9,334	86.39%	88.65%	87.38%
PJM	RECO	1	8	- /	0,320	476	146	7,009	146	30.62%	0.00%	30.62%
PJM	UGI	1	10		98	176	95	42	53	34.58%	48.54%	30.02%
PJM	VAP					18,550						53.05%
		6			22,630		26,826	16,985	9,841	65.14%	75.43%	
	AEC		10	,	1,481	1,014	1,129	881	248	45.26%	57.80%	24.50%
	SMEPA	1			684	690	433	248	184	31.48%	53.10%	26.74%
	SOCO	15			60,597	47,335	91,634	52,053	39,582	84.90%	84.90%	83.62%
SPP	AEPW	3			16,633	9,725	23,747	15,344	8,403	90.10%	91.94%	86.40%
SPP	CELE	1	10	- /	4,083	2,250	2,562	1,820	742	40.46%	48.75%	32.98%
SPP	EMDE	1	10	, -	1,338	1,088	1,510	1,052	458	62.26%	79.30%	42.12%
SPP	GRDA	1		,	1,595	792	1,027	849	179	43.03%	52.74%	22.53%
	INDN	1	10		288	318	220	143	77	36.26%	49.65%	24.15%
SPP	KACP	2		-,	4,403	3,636	1,961	670	1,291	24.39%	28.18%	35.49%
SPP	KACY	1	10	, -	680	499	413	316	97	35.00%	46.47%	19.37%
SPP	LAFA	1			295	436	282	175	107	38.60%	59.32%	24.58%
SPP	LEPA	1			201	251	162	89	73	35.93%	45.37%	29.24%
SPP	MIDW	1	10		32	345	111	19	92	29.46%	78.16%	26.68%
SPP	OKGE	1	10		7,931	5,837	4,462	2,059	2,403	32.41%	25.48%	41.17%
SPP	OMPA	1	10		163	637	481	163	318	60.07%	100.00%	49.86%
SPP	SPRM	1	10	1,457	689	768	582	236	346	39.93%	40.93%	45.02%
SPP	SPS	1	10	11,914	7,175	4,740	7,393	4,420	2,973	62.05%	63.18%	62.72%
SPP	SWPA	1	10	3,016	2,186	830	866	478	388	28.71%	21.86%	46.75%
SPP	WERE	3	10	12,806	7,356	5,450	10,320	6,536	3,783	80.58%	89.87%	69.42%
SPP	WFEC	1	10	2,396	1,131	1,265	659	337	322	27.52%	35.36%	25.49%
TVAUTHOR	BCA	1	1	94	80	14	94	80	14	100.00%	100.00%	100.00%
TVAUTHOR	DOE	1	5	1,374	474	900	783	474	309	56.96%	100.00%	34.30%
TVAUTHOR	TVA	7	10	75,333	42,281	33,053	75,120	42,281	32,839	99.72%	100.00%	99.35%
VACAR	CPLE	2	10	24,266	12,105	12,161	19,285	9,910	9,375	79.47%	81.01%	77.09%
VACAR	CPLW	1	10		1,389	788	898	712	186	41.24%	49.26%	23.56%
VACAR	DUK	4	10	42,741	22,228	20,512	40,388	21,046	19,341	94.49%	94.68%	94.29%
VACAR	SCEG	2	10		6,929	5,029	10,603	5,906	4,696	88.67%	88.26%	93.39%
VACAR	SCPSA	2			4,348	4,644	6,523	3,287	3,236	72.54%	68.63%	69.68%
VACAR	YAD	1	1	17	13	4	31	27	4	177.07%	100.00%	100.00%
Systemwide		255	1100		738,554	617,019	1,035,734	569,134	466,600			

Unique Cluster	Cluster Long Name	AREA	CLUSTER	Gen Weight	<b>Load Weight</b>	Number of Buses		Full Name
AE-7	AE_7_MSA_OceanCity_G	AE	7	90	836		MIDDLE03	Middle 3
AEC-8	AEC_8_G	AEC	8	903	60		MINTOSH1	McIntosh (Washington County)
AECI-3	AECI_3_L	AECI	3	-	915	125		
AECI-4	AECI_4_GEN_NewMadrid1_G	AECI	4	2,315	248		NEW MA01	New Madrid 1
AECI-7	AECI_7_MSA_KansasCity_L	AECI	7	-	615	102		
AECI-9	AECI_9_L	AECI	9	-	694	85		
AEP-1	AEP_1_MSA_Lynchburg_G	AEP	1	843	2,162		AEP HY01	
AEP-2	AEP_2_STA_TN-WV_L	AEP	2	1,284	2,977		AMOS 02	John E Amos 2
AEP-3	AEP_3_MSA_Columbus_L	AEP	3	10,204	8,244		AMOS 02	John E Amos 2
AEP-8	AEP_8_GEN_Amos01_G	AEP	8	19,694	6,544		AMOS 01	John E Amos 1
AEP-9	AEP_9_MSA_Canton-Massillon_L	AEP	9	733	2,120		DRESDNRG	Dresden Energy
AEPW-1	AEPW_1_MSA_Tulsa_G	AEPW	1	3,295	2,000		TULSA	Congentrix/Tulsa (Jenks)
AEPW-5	AEPW_5_MSA_Tulsa_G	AEPW	5	4,226	2,571		FLINTC01	Flint Creek
AEPW-9	AEPW_9_MSA_MountPleasant_G	AEPW	9	8,168	3,832		WELSHDC	DC Link - Welsh
ALTE-2	ALTE_2_MSA_Madison_G	ALTE	2	1,665	441		COLUMB01	Columbia 1
ALTW-6	ALTW_6_MSA_CedarRapids_L	ALTW	6	996	1,103		ARNOLD01	Duane Arnold
AMRN-12	AMRN_12_MSA_StLouis_L	AMRN	12	5,059	6,066		RUSH I01	Rush Island 1
AMRN-2	AMRN_2_County_Macon_L	AMRN	2	174	1,209		AMGIBSON	Ameren/Gibson City CTs (#1/#
AP-1	AP_1_County_Harrison_G	AP	1	6,563	2,223		HARRSN01	Harrison 1
AP-2	AP_2_GEN_Albright3_L	AP	2	603	1,748		ALBRIG03	Albright 3
AP-7	AP_7_MSA_Hagerstown-Martinsburg_L	AP	7	203	1,153		SMITH 03	R P Smith (9)
AP-8	AP_8_MSA_DC-VA-MD_L	AP	8	-	1,097	21		
BCA-1	BCA_1_GEN_NRGBatesville_G	BCA	1	87	14		NRGBATES	NRG Batesville
BGE-10	BGE_10_MSA_Baltimore-Towson_L	BGE	10	845	1,565		WAGNER03	Herbert A Wagner 3
BGE-5	BGE_5_MSA_Baltimore-Towson_L	BGE	5	263	1,462		CRANE 02	C P Crane2
BGE-7	BGE_7_MSA_Baltimore-Towson_G	BGE	7	2,548	1,043		BRANDO01	Brandon Shores1
BGE-8	BGE_8_MSA_Baltimore-Towson_L	BGE	8	-	840	27		
BGE-9	BGE_9_MSA_Baltimore-Towson_L	BGE	9	-	1,186	32		
BREC-3	BREC_3_County_Webster_G	BREC	3	1,355	476		D B WI01	D B Wilson
CELE-10	CELE_10_MSA_Alexandria_G	CELE	10	1,895	742		CLCEVAN	Cleco Evangeline
CILC-8	CILC_8_MSA_Peoria_G	CILC	8	756	349		EDWARD03	E D Edwards 3
CIN-1	CIN_1_MSA_Indianapolis_L	CIN	1	816	4,274		NOBLES03	Noblesville 3
CIN-3	CIN_3_MSA_TerreHaute_G	CIN	3	3,230	1,015		DUKEVERM	Duke Energy Vermillion
CIN-4	CIN_4_MSA_Cincinnati-Middletown_G	CIN	4	6,026	5,727		ZIMMER01	W H Zimmer
CIN-7	CIN_7_MSA_Lafayette_L	CIN	7	144	1,712		WESTEND	West End
CIN-8	CIN_8_MSA_Evansville_G	CIN	8	3,657	260		GIBSON01	Gibson 1
CPLE-1	CPLE_1_MSA_Durham_G	CPLE	1	10,224	8,563		HARRIS01	Shearon-Harris
CPLE-9	CPLE_9_MSA_NewBern_L	CPLE	9	53	811		SAVANNAH	Savannah River Plant
CPLW-3	CPLW_3_Asheville_G	CPLW	3	764	93		ASHVIL01	Asheville ST 1
CWLD-2	CWLD_2_MSA_Columbia_L	CWLD	2	-	48	1		
CWLP-1	CWLP_1_MSA_Springfield_G	CWLP	1	310	227	13	DALLMA01	Dallman 1
DENL-7	DENL_7_MSA_LittleRock_L	DENL	7	-	81	1		
DERS-1	DERS_1_MSA_Ruston_G	DERS	1	75	68		RUSTON23	Ruston 2 & 3
DLCO-1	DLCO_1_MSA_Pittsburgh_L	DLCO	1	-	635	12		
DLCO-7	DLCO_7_MSA_Pittsburgh_G	DLCO	7	1,644	25		BEAVER01	Beaver Valley 1
DOE-2	DOE_2_MSA_Paducah_G	DOE	2	520	309		CLVRTCTY	Enron Calvert City
DP&L-6	DP&L_6_MSA_Seaford_L	DP&L	6	1,438	1,523		INDPJM04	Indian River 4
DPC-10	DPC_10_G	DPC	10	615	140		MADGET01	John P. Madgett
DPL-3	DPL_3_MSA_Dayton_L	DPL	3	1,350	2,652		PIQUA 03	Piqua 3
DPL-8	DPL_8_GEN_Killen_G	DPL	8	2,964	-		KILLEN	Killen Station GT1
DUK-4	DUK_4_MSA_Greenville_L	DUK	4	3,546	4,489		DUKEHY01	0
DUK-5	DUK_5_MSA_Seneca_G	DUK	5	1,911	-	3	BAD CR04	Bad Creek 1-4

Unique Cluster	Cluster Long Name	AREA	CLUSTER	Gen Weight	Load Weight	Number of Buses		Full Name
DUK-8	DUK_8_MSA_Charlotte_L	DUK	8	1,407	4,886	57	DUKEHY01	0
DUK-9	DUK_9_MSA_Charlotte_G	DUK	9	14,681	9,966	146	MC GUI01	McGuire 1
EEI-2	EEI_2_MSA_Paducah_G	EEI	2	507	36	3	JOPPA 01	Joppa Steam 1
EES-1	EES_1_MSA_Jackson_L	EES	1	3,218	3,066	160	ANDRUS01	Gerald Andrus
EES-10	EES_10_MSA_Vicksburg_G	EES	10	3,544	1,249	86	GRAND 01	Grand Gulf
EES-2	EES_2_MSA_Batesville_G	EES	2	3,525	1,697	84	WHITE 02	White Bluff 2
EES-3	EES_3_MSA_Beaumont-PortArthur_L	EES	3	265	1,099	84	NECHES04	Neches 4
EES-4	EES_4_G	EES	4	6,345	2,417	176	CGXOUACH	Ouachita Power (Cogentrix)
EES-5	EES_5_MSA_NewOrleans_G	EES	5	9,735	9,294	271	WATERF03	Waterford 3
EES-7	EES_7_MSA_Beaumont-PortArthur_G	EES	7	7,393	4,949	419	TNSKFRNT	Tenaska Frontier (Shiro)
EES-8	EES_8_MSA_BatonRouge_G	EES	8	1,060	-	1	RIVERB01	Riverbend 1
EES-9	EES_9_MSA_Russellville_G	EES	9	6,123	4,517		ARKANS02	Arkansas Nuclear One #2
EKPC-8	EKPC_8_MSA_Maysville_G	EKPC	8	1,396	272	17	SPURLO02	H L Spurlock 2
EMDE-1	EMDE_1_MSA_Joplin_G	EMDE	1	1,102	458	54	STATEL03	Stateline 3
FE-10	FE_10_MSA_Mansfield_L	FE	10	46	859	27	GALION	Galion Generating Facilities
FE-4	FE 4 MSA Akron L	FE	4	531	2,277	61	BURGER04	R E Burger 4
FE-5	FE_5_MSA_Cleveland_L	FE	5	3,216	4,680		PAINES02	Painesville 2
FE-6	FE 6 MSA Pittsburgh G	FE	6	2,371	213	3	MANSFI03	Bruce Mansfield 3
FE-7	FE 7 MSA Toledo L	FE	7	2,586	2,106		FREMONT	Fremont Energy Center
FE-8	FE 8 MSA Youngstown L	FE	8	939	2,217		SAMMIS01	W H Sammis 1
FE-9	FE 9 MSA Weirton G	FE	9	1.860	112		SAMMIS06	W H Sammis 6
FMP-8	FMP_8_MSA_Sebastian_G	FMP	8	145	20		VERO B04	Vero Beach Municipal 4
FPC-10	FPC 10 MSA Lakeland G	FPC	10	3,561	747		HINESCC2	Hines CC2
FPC-2	FPC_2_MSA_HomosassaSprings_G	FPC	2	1,584	-		CRYSTA03	Crystal River 3
FPC-3	FPC_3_MSA_Orlando_L	FPC	3	1,232	3,649		DEBARYCT	Debary CT
FPC-4	FPC 4 MSA Tampa L	FPC	4	2,239	2,873		ANCLOT01	Anclote 1
FPL-2	FPL_2_MSA_FortMyers_G	FPL	2	5,929	4,563		MANATE03	Manatee 3
FPL-3	FPL 3 MSA Miami L	FPL	3	6,944	7.089		TURKEY03	Turkey Point 3
FPL-7	FPL 7 MSA Miami L	FPL	7	570	3,923		BROWARDN	Broward Res. Rec.
FPL-8	FPL 8 MSA PortStLucie G	FPL	8	10.364	4.623		SANFOR04	Sanford 4
FTP-7	FTP_7_MSA_PortStLucie_G	FTP	7	93	,020		H D KI08	Henry D. King 8
GRDA-2	GRDA 2 G	GRDA	2	849	179		GRDA 01	GRDA 1
GRE-4	GRE_4_MSA_Minneapolis_L	GRE	4	331	1,111		CAMBRICT	Cambridge New CT
GVL-3	GVL_3_MSA_Gainesville_G	GVL	3	433	15		DEERHA02	Deerhaven 2
HE-9	HE 9 MSA TerreHaute G	HE	9	1,016	27		MEROM 01	Merom 1
HST-1	HST 1 MSA Miami L	HST	1	-	78	1	WEIGH OT	INGIGHT I
IESO-11	IESO 11 G	IESO	11	9,529	12,779	354	OTTAWAMD	Ottawa Cogen
IESO-15	IESO 15 G	IESO	15	1,964	3,375		NANTICO5	Nanticoke 5
IESO-13	IESO 2 G	IESO	2	2,437	2.116		GRNFLD1	Greenfield Energy Centre 1
IESO-3	IESO 3 L	IESO	3	39	1,696		MELGREY1	Melancthon Grey Wind 1
IESO-6	IESO 6 G	IESO	6	2,146	1,090		BRUCE 3	Bruce 3
IESO-7	IESO 7 G	IESO	7	2,140	253		BRUCE 8	Bruce 8
INDN-6	INDN_6_MSA_KansasCity_G	INDN	6	143	27		BLUE V01	Blue Valley GT1
IP-7	IP 7 GEN Baldwin G	IP.	7	1,900	444		BALDWI02	Baldwin Energy Complex 2
IP-8	IP 8 GEN Clinton G	IP	8	2,302	1,195		CLINTO01	Clinton
IPL-2	IPL 2 MSA Jasper G	IPL	2	1,678	1,193		PETERS04	Petersburg 4
IPL-5	IPL 5 MSA Indianapolis L	IPL	5	306	1,187			Georgetown GT#1-#3
IPL-8	IPL 8 MSA Indianapolis L	IPL	8	547	1,107		STOUTF07	Elmer W Stout IC7
ITC-2	ITC 2 MSA Detroit L	ITC	2	4,001	5,247		FERMI -2	Fermi 2
ITC-3	ITC 3 MSA Detroit G	ITC	3	3,815	1,600		GREENW 1	Greenwood 1
ITC-7	ITC_3_MSA_Detroit_G  ITC 7 MSA Monroe G	ITC	7	1,500	-		MONROE01	Monroe 1
ITC-7		ITC	9	1,340	4,751		RIVER 3	
116-9	ITC_9_MSA_Detroit_L	IIIC	B	1,340	4,751	11	KIVEK 3	River Rouge 3

KACP-4   KACP 4 MSA KansasCity G   KACP 4   670   -   1   IATAN 01   Iatan									
JCPL 3				CLUSTER	Gen Weight	<b>Load Weight</b>	Number of Buses	MAPS Units	Full Name
JEA.6   JEA.6   MSA_Jacksonwille G		JCPL_1_MSA_NewYork_L		1	-	, -			
KACP-4	CPL-3	JCPL_3_MSA_NewYork_L	JCPL	3	1,315	2,735			Oyster Creek 1
KACP-7   KACP 7, MSA, Kansascity, L KACP 7   1.291   24	A-6		JEA	6	1,665	358	13	ST JOH02	St. Johns River Power 2
KACY-10 MSA Kansasclity G KACY 10 316 40 3 GUINDA01 Quindaro GT1 KEY-1 MKEY-1 MKEY-1 MK ReyWest G KEY 1 1 880 138 11 STANTO30 Station Energy Cen KIS-10 KIS-10 MSA, Collando G KIS 10 410 - 5 KUCANEG3 KUA Cane 3 LAFA-7 KIS-10 KIS-10 MSA, Collando G KIS 10 410 - 5 KUCANEG3 KUA Cane 3 LAFA-7 KIS-10 KIS-10 MSA, Lalayette G LAFA 7 175 - 1 BONIN 03 Bonin 3 Bonin 3 Bonin 3 Bonin 3 LAGN-1 LAFA-7 MSA, Lalayette G LAFA 7 175 - 1 BONIN 03 Bonin 3 Bonin 5 CL LAFA 7 1 LAFA-7 MSA, Lalayette G LAFA 7 175 - 1 BONIN 03 Bonin 3 Bonin 5 CL LAFA 7 1 LAFA-7 MSA, Lalayette G LAFA 7 1 LAFA-7 MSA, Lalayette G LAFA 7 1 LAFA-7 MSA, Lalayette G LAFA 1 1 819 28 6 MCINTOSC Mc Intosh 5 CC LEFA-8 LAFA-1 LAFA-1 LAFA-1 LAFA-1 LAFA-1 MSA, Lalayette G LAFA 1 1 819 28 6 MCINTOSC Mc Intosh 5 CC LEFA-8 LEFA-5 MSA, Houns-Bayou, G LEFA 5 93 73 1 HOUMA 14 Hours 14 LES-5 LES-5 MSA, Lincoln G LES-5 5 2244 108 9 ROKERYOZ Rokety 2 LIGES-6 LIGE-5 MSA, Larayetto LIGE-5 S LOSE-6 MSA, Larayetto LIGE-6 S LIGE-6	ACP-4	KACP_4_MSA_KansasCity_G	KACP	4	670	-	1	IATAN 01	latan
KEY1	ACP-7	KACP_7_MSA_KansasCity_L	KACP	7	-	1,291	24		
KIS-10 KIS 10 MSA Orlando G KIS 10 410 - SKUCANEGO KIS 10 410 - SKUCANEGO KUA Cane 3 LAGN-1 LAFA-7 MSA Lafayette G LAFA 7 175 - 180NIN 03 Bonin 3 LAGN-1 LAGN-1 MSA BatonRouge G LAGN 1 2,199 163 13 IG CA22 Big Cajun 2 #2 LAK-1 LAK-1 MSA BatonRouge G LAGN 1 819 28 6 MCINTOSC Me Introbe 5 CC LEFA-5 LEFA 5 MSA Houma-Bayou G LEFA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA Houma-Bayou G LEPA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA Houma-Bayou G LEPA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA Houma-Bayou G LEPA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA Houma-Bayou G LEPA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA Houma-Bayou G LEPA 5 93 73 11 HOUMA-14 Houma-14 LES-5 LES-5 MSA LEXINGTON G LES 5 5 264 108 9 PROKESYO2 Rokely 2 LGEE-3 LGEE 3 GEN Cehnt2 G LGEE 3 2,000 225 8 8 GHENT 02 Chent 2 LGEE-3 LGEE 5 MSA Lexington L LGEE 5 5 595 23.45 1216 HARDD-L Hardinsburg Station LGEE-8 LGEE 5 MSA Lexington L LGEE 8 3 33 771 68 KU PAR03 Prieville LGEE-8 LGEE 9 MSA Louisville G LGEE 9 1,136 1,763 52 BLUGRSS Blue Grass Generati LWU-1 LWU 1 MSA Miami G LWU 1 250 82 3 JKW WORTH Lake Worth MEC-3 MSA DesMonies G MSC 3 3,307 1393 1115 COUNCIG Gouncil Bluffs 3 METC-4 METC-4 MSA Holland-GrandHaven G METC 4 7,365 2,900 136 MWWIND Michigan Wind Erne METC-8 METC-8 MSA SA BoyClive G METC 1 7,365 2,900 136 MWWIND Michigan Wind Erne METC-9 METC-9 MSA Kalamazoo L METC 9 113 MGLAND Midiand-Coopeneratic MGET-1 MGETD-1 MSA Reading G METED 4 MSA Reading	ACY-10	KACY_10_MSA_KansasCity_G	KACY	10	316	40	3	QUINDA01	Quindaro GT1
LAFA 7	EY-1	KEY_1_MSA_KeyWest_G	KEY	1	880	138	11	STANTO03	Stanton Energy Center 3 CC
LAGN-1 LAK-1 MSA_BatonRouge_G LAGN 1 2,199 163 13 IGC GA22 Big Cajun 2 #22 LKH-1 LAK-1 MSA_Lakeland_G LAK 1 819 28 6 MCNITOSC Me Intends ToC LEPA-6 LEPA-6 LEPA-6 MEPA-6 LEPA-6 MEPA-6 LEPA-6 LEPA-6 MEPA-6 LEPA-6 MEPA-6 LEPA-6 MEPA-6 LES-5 MSA_Lincoln_G LEPA-5 93 73 1 HCUMA-14 Houma-14 LES-5 LES-5 MSA_Lincoln_G LES-5 LES-5 MSA_Lincoln_G LES-5 264 108 9 ROKEBY02 Rokeby 2 LGEE-3 LGEE_3 GEN_Gehnt2_G LGEE_3 2,000 225 8 6 HPMT 02 Ghent 2 LGEE-6 LGEE_5 MSA_Lexington_L LGEE_6 S 2,000 225 8 6 HPMT 02 Ghent 2 LGEE-6 LGEE_5 MSA_Lexington_L LGEE_8 S 32,000 225 8 6 HPMT 02 Ghent 2 LGEE-6 LGEE_8 MSA_Lexington_L LGEE_8 S 33 7771 68 KU PAROPL_Hardinsburg Station_LGEE-9 LGEE_9 MSA_Louisville_G LGEE_8 S 33 7771 68 KU PAROPL_Hardinsburg Station_LGEE-9 LGEE_9 MSA_Louisville_G LGEE_9 S 1,136 1,763 52 BLUGRSS Blue Grass General MCH-1 LWU_1 MSA_Mami_G LWU_1 1 250 82 3 JKL WORTH_Lake Worth MEC-3 MEC_3 MSA_DesMoines_G MEC_3 3,307 1,933 115 COUNCIG3 Council Bluffs 3 MEC_6	S-10	KIS_10_MSA_Orlando_G	KIS	10	410	-	5	KUCANE03	KUA Cane 3
LAGN-1   LAGN 1_MSA_Bateland G	AFA-7	LAFA_7_MSA_Lafayette_G	LAFA	7	175	-	1	BONIN 03	Bonin 3
LAK-1   LAK 1 MSA Lakeland G	AGN-1		LAGN	1	2,199	163	13	BIG CA22	Big Cajun 2 #2
LES-5 LES 5 MSA Lincoln G LES 5 264 108 9 ROKEBYOZ Rokeby 2 LGEE-3 LGEE-3 3 2,000 226 8 GHENT 02 Ghent 2 LGEE-5 LGEE-5 LGEE-5 MSA Lexington L LGEE 5 585 2,345 126 HARDDPL Hardinsburg Station LGEE-8 LGEE-8 MSA Lexington L LGEE 8 3 33 771 68 KU PARO3 Prineville LGEE-8 LGEE-9 MSA Louisville G LGEE 9 1,136 17,63 52 BLUGRSS Blue Grass General LWU-1 LWU-1 MSA Miamin G LWU-1 255 82 3 LK WORTH Lake Worth MEC-3 MEC-3 MEC-3 MSA Deskloines G MEC 3 3,307 115 COUNCIDS Council Bluffs 3 MET-4 MET-4 MSA Holland-GrandHaven, G METC 4 7,365 2,900 136 MWINDD Michigan Wind Enem METC-8 METC-8 MSA BayCity G METC 4 7,365 2,900 136 MWINDD Michigan Wind Enem METC-9 METC-9 MSA Kalamazoo L METC 9 118 1,334 44 KLMAZOO Kalamazoo River Ge METC-9 METC-9 MSA Kalamazoo L METC 9 118 1,334 44 KLMAZOO Kalamazoo River Ge METC-9 METC-	\K-1	LAK 1 MSA Lakeland G	LAK	1	819	28	6	MCINT05C	
LES-5 LES 5 MSA Lincoln G LES 5 264 108 9 ROKEBYOZ Rokeby 2 LGEE-3 LGEE-3 GEN GENT2 G LGEE-3 3 2,000 225 8 GENT-02 Chent 2 LGEE-5 LGEE-5 MSA Lexington L LGEE 5 5 595 2,346 126 HARDDPL Hardinsburg Station LGEE-8 LGEE-8 LGEE-8 MSA Lexington L LGEE 8 3 30 771 68 KU PAR03 Prineville LGEE-8 LGEE-8 LGEE-8 MSA Louisville G LGEE 9 1,136 1,763 52 BLUGRSS Blue Grass Generat LWU-1 LWU 1 MSA Miami G LWU 1 255 82 3 LK WORTH Lake Worth MEC-3 MEC-3 MEC-3 MSA Deskholines G MEC 3 3,307 1,933 115 COUNCIDS Council Blufts 3 MEC-3 MEC-4 MSA Holland-GrandHaven G METC 4 7,365 2,900 136 MWNND Michigan Wind Enem METC-8 METC-8 MSA BayCity G METC 4 7,365 2,900 136 MWNND Michigan Wind Enem METC-9 METC-9 MSA Kalamazoo L METC 9 118 1,334 44 KLMAZOO Kalamazoo River G METC-9 METC	PA-5	LEPA 5 MSA Houma-Bayou G	LEPA	5	93	73	1	HOUMA 14	Houma 14
LGEE-3	S-5		LES	5	264	108			Rokeby 2
LGEE-5   LGEE 5 MSA Lexington L   LGEE 5   5965   2,345   126   HARDDPL   Hardinsburg Station   LGEE-8   LGEE 8   LGEE 8   LGEE 8   33   771   68   KU PARD3   Prieville   LGEE-9   LGEE-9   LGEE-9   LGEE-9   LGEE-9   LGEE 9   1,136   1,763   52   SLUGRSS   Sluc Grass Generatic LWU-1   LWU 1   MSA Miami G   LVU 1   1   250   82   3   LK WORTH   Lake Worth   LAke Worth   Lake Worth   LWU-1   MSA Miami G   LVU 1   1   250   82   3   LK WORTH   Lake Worth   L									
LGEE-8   LGEE 8   LGEE 8   LGEE 8   LGEE 8   S.33   T71   G6   KU PAR03   Pineville   LGEE-9   LGEE-9   LGEE-9   STATE   SELUCRSS   Blue Grass Generatic   LWU									
Light   Ligh									
LWU 1									
MEC-3   MEC-3   MSA DesMoines G   MEC   3   3,307   1,933   115   COUNCIG3   Council Bluffs 3   METC-4   METC-4   MSA BayCity G   METC   4   7,365   2,900   138   MIWIND   Michigan Wind Enem METC-8   METC   8   MSA BayCity G   METC   8   3,795   2,562   113   MIDLAND   Michigan Wind Enem METC-9	-			1					
METC-4   METC 4, MSA, Holland-GrandHaven_G   METC   4   7,365   2,900   136   MIVIND   Michigan Wind Ener   METC-8   METC 8, MSA, BayCity_G   METC 8   3,795   2,562   113   MIDLAND   Midland Cogeneratic METC-9   METC 9, MSA, Kalamazoo_L   METC 9   118   1,334   44   KLMAZOO   Kalamazoo River Ge   METED-4   METED_4   MSA, Reading_G   METED   4   913   854   57   NTEMPLE   North Temple/Ontels   METED_4   MSA, Reading_G   METED   4   913   854   57   NTEMPLE   North Temple/Ontels   MIDW-7   MIDW_7   MSA, MSA, Hays_L   MIDW   7   19   92   5   HAYS 01   Hays   MIDW-7   MIDW_7   MSA, KansasCity_G   MIPU   7   1,307   437   28   AQUILA   Pleasant Hill (MO) 1   MP-7   MP_7   MSA, Dutub_L   MP   7   514   824   54   MNPOHYOI   MPW-1   MPW_1   MSA, Muscatine_G   MPW   1   151   16   2   MUSCATO9   Muscatine_Brant_Hill (MO) 1   MEPOOL_1   NEPOOL_1 VT   NEPOOL_1   1   821   1,115   146   VT.YK   VERMONT YANKEE   NEPOOL-10   NEPOOL_2   NEPOOL_2   NEPOOL_2   NEPOOL_2   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_3   NEPOOL_4   NEPOOL_4   NEPOOL_5   SEMA   NEPOOL_5   NEPOOL_5   MEPOOL_5   MEPOOL_5   MEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_6   NEPOOL_7   NEPOOL_7   NEPOOL_7   NEPOOL_8   NEPOOL_8   NEPOOL_8   NEPOOL_9	_			3					
METC-8				_					
METC-9   METC 9 MSA Kalamazoo L   METC   9   118   1,334   44   KLMAZOO   Kalamazoo River Ge   METED-4   METED 4 MSA Reading G   METED 4   913   854   57   NTEMPLE   North Temple/Ontele   MGE-7									U U
METED_4   METED_4 MSA_Reading_G   METED   4   913   854   57   NTEMPLE   North Temple/Ontele   MGE-7		/ /-							Ü
MGE -7   MGE 7 MSA Madison L   MGE 7   399   403   23 UNIVWISC   University of Wiscon MIDW -7				_					
MIDW-7   MIDW-7 MSA Hays L				4					
MIPU-7         MIPU_7_MSA_KansasCity_G         MIPU         7         1,307         437         28         AQUILA         Pleasant Hill (MO) 1           MP-7         MP_7_MSA_Duluth_L         MP         7         514         824         54 MMPOHY01         Muscatine Plant #15           MPW-1         MPW_1_MSA_Muscatine_G         MPW         1         151         16         2_MUSCAT09         Muscatine Plant #15           NEPOOL-1         NEPOOL_1VT         NEPOOL         1         821         1,115         146         VT.YK         VERMONT YANKEE           NEPOOL-10         NEPOOL_10 RI         NEPOOL         10         2,062         2,203         99 RIHOPE         R.I. Hope Energy (R           NEPOOL-3         NEPOOL_2 NH         NEPOOL         2         4,204         2,621         112         SEA1         SEABROOK           NEPOOL-3         NEPOOL_3 ME         NEPOOL         3         3,494         2,522         150 WYMAN4         YARMOUTH 4 (Wyn           NEPOOL-4         NEPOOL_3 MEBOS         NEPOOL         4         3,262         5,904         152 SIMYST2         Sithe Mystic 9           NEPOOL-4         NEPOOL_6         NEPOOL         5         6,454         3,978         163         PLGRM1				7					
MP-7         MP_MSA_Duluth_L         MP         7         514         824         54 MNPOHY01           MPW-1         MPW 1 MSA_Muscatine_G         MPW 1         151         16         2 MUSCAT09         Muscatine Plant #15           NEPOOL-1         NEPOOL_1 NEPOOL_1 NEPOOL_1 NEPOOL_1         821         1,115         146         VT.YK         VERMONT YANKEE           NEPOOL-10         NEPOOL_1 NEPOOL_1 RI         NEPOOL_1         0         2,062         2,203         99 RIHOPE         R.I. Hope Energy (R           NEPOOL-2         NEPOOL_2 NH         NEPOOL_2         4,204         2,621         112         SEA1         SEABROOK           NEPOOL-3         NEPOOL_3 ME         NEPOOL_3         3,494         2,522         150         WYMANA         YARMOUTH 4 (Wyn           NEPOOL-4         NEPOOL_4 NEBOS         NEPOOL_4         3,262         5,904         152         SIMYST2         Sithe Mystic 9           NEPOOL-5         NEPOOL_5 SEMA         NEPOOL_5         6,454         3,978         163         PLGRM1         PLGRIM           NEPOOL-6         NEPOOL_6 WCMA         NEPOOL_6         4,285         3,417         205         NORTHFIE         Northfield Mountain           NEPOOL-8         NEPOOL_8 SWCT				7					
MPW-1         MPW_1_MSA_Muscatine_G         MPW         1         151         16         2         MUSCAT09         Muscatine Plant #1 st           NEPOOL-1         NEPOOL_1 VT         NEPOOL         1         821         1,115         146 VT.YK         VERMONT YANKEE           NEPOOL-10         NEPOOL_10 RI         NEPOOL         10         2,062         2,203         99 RIHOPE         RI. Hope Energy (R           NEPOOL-2         NEPOOL_2 NH         NEPOOL         2         4,204         2,621         112 SEA1         SEABROOK           NEPOOL-3         NEPOOL_3 ME         NEPOOL         3         3,494         2,522         150 WYMANA         YARMOUTH 4 (Wyn           NEPOOL-4         NEPOOL_3 ME         NEPOOL         4         3,262         5,904         152 SIMYST2         Sith Mystic 9           NEPOOL-5         NEPOOL_5 SEMA         NEPOOL         4         3,262         5,904         152 SIMYST2         Sith Mystic 9           NEPOOL-6         NEPOOL_5 SEMA         NEPOOL         6         4,285         3,417         205 NORTHFIE         Northfield Mountain           NEPOOL-7         NEPOOL_6 WCMA         NEPOOL         7         4,447         3,920         103 MILL3         MILL3 MILL3 MILL3 MILLSTONE POINT <td>-</td> <td></td> <td>_</td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td>Pleasant Hill (MO) 1</td>	-		_	7					Pleasant Hill (MO) 1
NEPOOL-1				/					C C
NEPOOL-10				1					
NEPOOL-2   NEPOOL_2 NH				1					-
NEPOOL-3         NEPOOL_3 ME         NEPOOL         3         3,494         2,522         150         WYMAN4         YARMOUTH 4 (Wyn NEPOOL 4 NEPOOL 4 NEPOOL 4 NEPOOL 4 NEPOOL 4 NEPOOL 5 NEPOOL 6 NEPOOL 6 NEPOOL 6 NEPOOL 6 NEPOOL 6 NEPOOL 7 NEPOOL 8 NEPOOL 8 NEPOOL 8 NEPOOL 9 NI 13 NI 13 NI 13 NI 13 NI 13 NI 14 NI 15 NI				10					02 \
NEPOOL-4         NEPOOL_4_NEBOS         NEPOOL         4         3,262         5,904         152         SIMYST2         Sithe Mystic 9           NEPOOL-5         NEPOOL_5_SEMA         NEPOOL         5         6,454         3,978         163         PLGRM1         PILGRIM           NEPOOL-6         NEPOOL_6_WCMA         NEPOOL         6         4,285         3,417         205         NORTHFIE         Northfield Mountain           NEPOOL-7         NEPOOL_7_CT         NEPOOL         7         4,447         3,920         103         MILL3         MILLSTONE POINT           NEPOOL-8         NEPOOL_8_SWCT         NEPOOL         8         2,678         1,850         60         BridgPCC         BRIDGEPORT ENE           NEPOOL-9         NEPOOL_9_NWKST         NEPOOL         9         405         1,524         28         NORW2         NORWALK HARBOI           NI-13         NI_13_MSA_Chicago_L         NI         13         2,396         10,556         196         DUPAGE         Reliant DuPage Cou           NI-15         NI_13_MSA_Chicago_G         NI         15         2,479         -         4         QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2				2					
NEPOOL-5         NEPOOL_5_SEMA         NEPOOL         5         6,454         3,978         163 PLGRM1         PILGRIM           NEPOOL-6         NEPOOL_6_WCMA         NEPOOL         6         4,285         3,417         205 NORTHFIE         Northfield Mountain           NEPOOL-7         NEPOOL_7 CT         NEPOOL         7         4,447         3,920         103 MILL3         MILLSTONE POINT           NEPOOL-8         NEPOOL_8 SWCT         NEPOOL         8         2,678         1,850         60 BridgPCC         BRIDGEPORT ENE           NEPOOL-9         NEPOOL_9 NWKST         NEPOOL         9         405         1,524         28 NORW2         NORWALK HARRD           NI-13         NI_13_MSA_Chicago_L         NI         13         2,396         10,556         196 DUPAGE         Reliant DuPage Cou           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4 QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53 BRAIDW01         Braidwood 1           NI-3         NI_2_MSA_Chicago_G         NI         3         26         1,205         22 WINNETKA         Winnetka ST (4-6-7)           NI-6 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
NEPOOL-6         NEPOOL_6_WCMA         NEPOOL         6         4,285         3,417         205         NORTHFIE         Northfield Mountain           NEPOOL-7         NEPOOL_7 CT         NEPOOL         7         4,447         3,920         103         MILL3         MILLSTONE POINT           NEPOOL-8         NEPOOL_8 SWCT         NEPOOL         8         2,678         1,850         60         BridgPCC         BRIDGEPORT ENE           NEPOOL-9         NEPOOL_9 NWKST         NEPOOL         9         405         1,524         28         NORW2         NORWALK HARBO           NI-13         NI_13_MSA_Chicago_L         NI         13         2,396         10,556         196         DUPAGE         Reliant DuPage Cou           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4 QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDW01         Braidwood 1           NI-3         NI_2_MSA_Chicago_G         NI         3         26         1,205         22         WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_3_MSA_Chicago_G         NI         6         9,759 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
NEPOOL-7         NEPOOL_7_CTT         NEPOOL         7         4,447         3,920         103         MILL3         MILLSTONE POINT           NEPOOL-8         NEPOOL_8_SWCT         NEPOOL         8         2,678         1,850         60         BridgPCC         BRIDGEPORT ENE           NEPOOL-9         NEPOOL_9         NWKST         NEPOOL         9         405         1,524         28         NORW2         NORWALK HARBOI           NI-13         NI_3_MSA_Chicago_L         NI         13         2,396         10,556         196         DUPAGE         Reliant DuPage Cou           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4         QUAD CO1         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDWO1         Braidwood 1           NI-20         NI_2_MSA_Chicago_G         NI         20         1,632         83         8         DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_G         NI         3         26         1,205         22         WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6									
NEPOOL-8         NEPOOL_8_SWCT         NEPOOL         8         2,678         1,850         60         BridgPCC         BRIDGEPORT ENE           NEPOOL-9         NEPOOL_9 NWKST         NEPOOL         9         405         1,524         28         NORW2         NORWALK HARBO           NI-13         NI_31_MSA_Chicago_L         NI         13         2,396         10,556         196         DUPAGE         Reliant DuPage Cou           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4         QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDWO1         Braidwood 1           NI-20         NI_20_MSA_Chicago_G         NI         20         1,632         83         8         DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_G         NI         3         26         1,205         22         WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253         DIESEL 1         Joliet 9           NIPS-8         NIPS-8_MSA_Chicago_G         NI         7         2,290 </td <td></td> <td></td> <td></td> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td>				6					
NEPOOL-9         NEPOOL_9_NWKST         NEPOOL         9         405         1,524         28         NORW2         NORWALK HARBOO           NI-13         NI_13_MSA_Chicago_L         NI         13         2,396         10,556         196         DUPAGE         Reliant DuPage Cou           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4         QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDW01         Braidwood 1           NI-20         NI_2_MSA_Chicago_G         NI         20         1,632         83         8         DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22         WINNETKA         WinnetKA Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253         DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2         BYRON 01         ByrON 01         ByrON 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8 </td <td></td> <td></td> <td></td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td>MILLSTONE POINT 3</td>				7					MILLSTONE POINT 3
NI-13         NI_13_MSA_Chicago_L         NI         13         2,396         10,556         196 DUPAGE         Reliant DuPage County           NI-15         NI_15_MSA_Davenport_G         NI         15         2,479         -         4 QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDW01         Braidwood 1           NI-20         NI_20_MSA_Chicago_G         NI         20         1,632         83         8 DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22         WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253         DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2         BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15									BRIDGEPORT ENERGY 1
NI-15         N_15_MSA_Davenport_G         NI         15         2,479         -         4 QUAD C01         Quad Cities 1           NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53         BRAIDW01         Braidwood 1           NI-20         NI_20_MSA_Chicago_G         NI         20         1,632         83         8 DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22 WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2         BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2	EPOOL-9	NEPOOL_9_NWKST	NEPOOL	9	405	1,524	28	NORW2	NORWALK HARBOR 2
NI-2         NI_2_MSA_Chicago_G         NI         2         5,342         1,283         53 BRAIDW01         Braidwood 1           NI-20         NI_20_MSA_Chicago_G         NI         20         1,632         83         8 DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22 WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2         BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_Grandisland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman_2	-13	NI_13_MSA_Chicago_L	NI	13	2,396	10,556	196	DUPAGE	Reliant DuPage County LP (Au
NI-20         NI_20_MSA_Chicago_G         NI         20         1,632         83         8 DRESDE03         Dresden 3           NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22 WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2         BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2	-15	NI_15_MSA_Davenport_G	NI	15	2,479	-	4	QUAD C01	Quad Cities 1
NI-3         NI_3_MSA_Chicago_L         NI         3         26         1,205         22 WINNETKA         Winnetka ST (4-6-7)           NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2 BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2	-2	NI_2_MSA_Chicago_G	NI	2	5,342	1,283	53	BRAIDW01	Braidwood 1
NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2 BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2	-20	NI_20_MSA_Chicago_G	NI	20	1,632	83	8	DRESDE03	Dresden 3
NI-6         NI_6_MSA_Chicago_G         NI         6         9,759         7,577         253 DIESEL 1         Joliet 9           NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2 BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2	-3	NI 3 MSA Chicago L	NI	3	26	1,205	22	WINNETKA	Winnetka ST (4-6-7)
NI-7         NI_7_MSA_Rochelle_G         NI         7         2,290         -         2 BYRON 01         Byron 1           NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2				6					
NIPS-8         NIPS_8_MSA_Chicago_G         NIPS         8         2,892         1,694         41         SCHAHF15         R M Schahfer 15           NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52         NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15         GENTLE02         Gentleman 2				7		,			
NPPD-1         NPPD_1_MSA_GrandIsland_L         NPPD         1         376         983         52 NPPDHY01           NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15 GENTLE02         Gentleman 2				8		1.694			
NPPD-4         NPPD_4_GEN_Gentleman_G         NPPD         4         2,702         148         15 GENTLE02         Gentleman 2				1					C Community
				4					`
				7					Considerate Constitution of the Constitution o
NSB-1 NSB_1_MSA_DaytonaBeach_G NSB 1 514 86 6IN_SMYRNA Duke New Smyrana				1					Duke New Smyrana
NYISO-1 NYISO 1 NYA NYISO 1 4,946 2,500 162 MOSESNIA Moses Niagara				1					
NYISO-10 NYISO 10 NYJ NYISO 10 10 10,283 11,493 123 RAVENS03 Ravenswood 3				10					<u> </u>

Unique Cluster	Cluster Long Name	AREA	CLUSTER	Gen Weight		Number of Buses		Full Name
NYISO-11	NYISO_11_NYK	NYISO	11	5,681	5,289		NORTHP04	Northport 4
NYISO-2	NYISO_2_NYB	NYISO	2	650	1,759	79	GINNA 01	Ginna 1
NYISO-3	NYISO_3_NYC	NYISO	3	6,711	2,657		9 MILE02	Nine Mile Pt 2
NYISO-4	NYISO_4_NYD	NYISO	4	1,206	681	40	MOSESSTL	Moses Power Dam
NYISO-5	NYISO_5_NYE	NYISO	5	1,098	909		NMPCHYE2	NMPC Hydro Zone E
NYISO-6	NYISO_6_NYF	NYISO	6	4,103	1,983	126	GILBOA01	Gilboa
NYISO-7	NYISO_7_NYG	NYISO	7	3,156	2,195		ROSETO02	Roseton 1
NYISO-8	NYISO_8_NYH	NYISO	8	2,021	973		INDIAN03	Indian Pt 3
NYISO-9	NYISO_9_NYI	NYISO	9	2	1,476		KENSICOH	Kensico
OKGE-4	OKGE_4_MSA_OklahomaCity_L	OKGE	4	2,102	2,403	93	SEMINO02	Seminole 2
OMPA-9	OMPA_9_MSA_PoncaCity_G	OMPA	9	163	147	8	PONCA 01	Ponca (1&2)
OPPD-5	OPPD_5_MSA_Omaha_L	OPPD	5	480	1,686	62	SARPY 03	Sarpy County 3
OTP-1	OTP_1_L	OTP	1	-	640	54		
OTP-9	OTP_9_GEN_BigStone_G	OTP	9	1,189	136	10	BIG ST01	Big Stone
OUC-1	OUC_1_MSA_Orlando_G	OUC	1	889	73	8	STANTO02	Stanton Energy Center 2
OVEC-3	OVEC_3_G	OVEC	3	1,620	10	1	CGNTRXCC	Cogentrix (Jackson County)
PECO-1	PECO_1_MSA_Philadelphia_G	PECO	1	2,323	554	35	MARCUS1	FPL Marcus Hook 1
PECO-5	PECO_5_MSA_Philadelphia_L	PECO	5	1,656	2,510	76	LIMERI01	Limerick 1
PECO-8	PECO_8_MSA_Philadelphia_L	PECO	8	399	1,064	25	SCHUYL01	Schuylkill 1
PENELEC-2	PENELEC 2 MSA DuBois G	PENELEC	2	2,724	1,196	150	HOMERC01	Homer City 1
PEPCO-1	PEPCO 1 MSA DC L	PEPCO	1	-	1,439	5		Í
PEPCO-4	PEPCO_4_MSA_DC_L	PEPCO	4	-	825	3		
PEPCO-5	PEPCO 5 MSA DC L	PEPCO	5	-	710	3		
PEPCO-7	PEPCO 7 MSA DC L	PEPCO	7	-	655	7		
PEPCO-8	PEPCO 8 MSA DC G	PEPCO	8	3,786	1,108	31	CHALK 03	Chalk Point3
PJM500-3	PJM500 3 MSA Pittsburgh G	PJM500	3	1,705	-	3	KEYSTO01	Keystone 1
PJM500-4	PJM500 4 MSA Philadelphia G	PJM500	4	2,383	-	10	LIMERI02	Limerick 2
PJM500-5	PJM500 5 MSA DC G	PJM500	5	1,730	-	2	CALVER02	Calvert Cliffs2
PJM500-7	PJM500 7 MSA York-Hanover G	PJM500	7	2,696	-		SUSQUE02	Susquehanna 2
PJM500-8	PJM500 8 MSA Philadelphia G	PJM500	8	3,914	-	6	SALEM 01	Salem 1
PJM500-9	PJM500_9_MSA_Pittsburgh_G	PJM500	9	1,700	-	2	CONEMA01	Conemaugh 1
PL-5	PL 5 MSA Lancaster L	PL	5	-	897	12		, and the second
PL-7	PL_7_MSA_Allentown_L	PL	7	245	1,051		MTBETHEL	PP&L Mount Bethel
PL-8	PL_8_MSA_Allentown_G	PL	8	2,853	385	22	MARTIN08	Martins Creek 4
PSEG-3	PSEG 3 MSA NewYork L	PSEG	3	1,843	2,275	66	LINDEN01	Linden 1
PSEG-5	PSEG 5 MSA Philadelphia L	PSEG	5	2,143	2,766	76	MERCER01	Mercer 1
PSEG-6	PSEG 6 MSA NewYork L	PSEG	6	-	639	13		
PSEG-8	PSEG 8 MSA NewYork G	PSEG	8	3,860	3,654	102	BERGEN01	Bergen1
RCU-6	RCU 6 MSA Orlando L	RCU	6	-	38	2		
RECO-1	RECO 1 MSA NewYork L	RECO	1	-	146	3		
SCEG-1	SCEG 1 MSA Columbia G	SCEG	1	4,954	2,752	127	SUMMER01	VC Summer 1
SCEG-9	SCEG_9_MSA_Charleston_G	SCEG	9	1,152	1,944		WILLMS01	Williams ST1
SCPSA-10	SCPSA_10_MSA_Charleston_G	SCPSA	10	1,680	,		CROSS 03	Cross 3
SCPSA-2	SCPSA 2 MSA Charleston L	SCPSA	2	1,607	3,236		WINYAH03	Winyah 3
SEC-6	SEC 6 MSA Palatka G	SEC	6	1,330	-		SEMINO02	Seminole 2
SIGE-9	SIGE 9 MSA Evansville L	SIGE	9	159	774		BROADW02	Broadway 2
SIPC-9	SIPC 9 MSA Marion-Herrin G	SIPC	9	432	37		MARION04	Marion 4
SMEPA-5	SMEPA 5 MSA Laurel G	SMEPA	5	341	184		MOSELL01	Moselle 1
SMMPA-9	SMMPA 9 MSA Rochester G	SMMPA	9	128	58		CASCAD01	Rochester Cascade Cr
SOCO-10	SOCO_10_MSA_Albany-Valdosta_L	SOCO	10	3,431	4,125		E I HA01	Edwin I Hatch
SOCO-15	SOCO_15_MSA_Birmingham_G	SOCO	15	12,464	9,217		ALAPHY01	0
SOCO-16	SOCO 16 MSA Atlanta L	SOCO	16	694	3,058		MC DON02	Jack Mcdonough 2

Unique Cluster	Cluster Long Name	AREA	CLUSTER	Gen Weight	Load Weight	Number of Buses	MAPS Units	Full Name
SOCO-17	SOCO 17 MSA Mobile G	SOCO	17	5,205	4,575		BARRY 05	Barry 5
SOCO-2	SOCO 2 GEN Hartwll G	SOCO	2	2,186	46		HARTWLL	0
SOCO-21	SOCO 21 MSA Atlanta G	SOCO	21	3.334	2,733		GEPCHY01	0
SOCO-22	SOCO 22 MSA Atlanta L	SOCO	22	41	661		BOWEN 06	Bowen 6
SOCO-26	SOCO 26 MSA Macon G	SOCO	26	6,802	-		VOGTLE01	Vogtle 1
SOCO-28	SOCO 28 MSA Birmingham G	SOCO	28	2,535	1,090		ALAPHY01	0
SOCO-31	SOCO 31 MSA Atlanta G	SOCO	31	11,765	1,583		BOWEN 04	Bowen 4
SOCO-32	SOCO_32_MSA_Pascagoula_G	SOCO	32	3,574	2,674		DANIEL03	Victor J Daniel Jr. 3
SOCO-33	SOCO_33_MSA_Atlanta_L	SOCO	33	3	3,305		DECALBRE	DeCalb Refuse (Seminole Rd)
SOCO-5	SOCO 5 GEN GEPCHY L	SOCO	5	2,098	3,403		GEPCHY01	0
SOCO-6	SOCO 6 MSA Augusta-Richmond L	SOCO	6	-	1,187	15		,
SOCO-8	SOCO 8 MSA Atlanta L	SOCO	8	_	1,925	34		
SPRM-10	SPRM_10_MSA_Springfield_L	SPRM	10	236	346		JAMES 05	James River Power St 5
SPS-2	SPS_2_GEN_Tolk1_G	SPS	2	4.480	2,973		TOLK 01	Tolk 1
STK-1	STK 1 L	STK	1	-,400	17	2	TOLK OT	TOIR T
SUNC-3	SUNC 3 MSA GardenCity G	SUNC	3	840	18	2	LAMARDC	DC Link - Lamar
SWPA-2	SWPA_2_MSA_MountainHome_G	SWPA	2	478	70		BULLSHL5	DC LIIK - Laillai
TAL-3	TAL 3 MSA Tallahassee G	TAL	3	336	- 70		PURDOM05	S. O. Purdom 5
TECO-3	TECO_3_MSA_Tampa_G	TECO	3	3,733	1,026		BAYSIDE2	TECO Bayside 2
TECO-7	TECO 7 MSA Tampa L	TECO	7	3,733	1,481	82	DATSIDEZ	TECO Bayside 2
TVA-1	TVA 1 MSA Chatt-Hunts G	TVA	1	17,334	9.966		TVA HY01	0
TVA-10	TVA 10 MSA Grenada L	TVA	10	17,334	9,966	23		0
TVA-10	TVA 3 MSA Knoxville L	TVA	3	3,684	5,102		TVA HY01	0
TVA-3		TVA	4	2,544	150		CUMBRL02	Cumbadand 2
TVA-4	TVA_4_MSA_Clarksville_G TVA 5 MSA Nashville L	TVA	5	9,154	8,858		TVA HY01	Cumberland 2
TVA-5	TVA_7_MSA_Memphis_L	TVA	7	7,215	5,982		TVA HY01	0
TVA-7	TVA 9 MSA Paducah G	TVA		4,470	2,130		TVA HY01	0
UGI-2	UGI 2 MSA Scranton G	UGI	9	4,470			HUNLOCK4	Hunlock 4
UPPC-9		UPPC		2	8 75			Hunlock 4
	UPPC_9_MSA_Houghton_L		9				UPPPHY01	0
VAP-1	VAP_1_MSA_Richmond_G	VAP	1 45	10,524	3,579		NORTHA01	North Anna 1
VAP-15	VAP_15_MSA_VB-Norfolk_L	VAP	15	435	1,297		CMNWLATL	Commonwealth Atlantic LP
VAP-26	VAP_26_MSA_DC_G	VAP	26	1,981	631		POSSUM04	Possum Point 4
VAP-27	VAP_27_MSA_DC_L	VAP	27	-	1,048	9		(1) 1/0
VAP-33	VAP_33_MSA_DC_L	VAP	33	910	2,983		GTVACA06	#N/A
VAP-7	VAP_7_G	VAP	7	4,179	303		BATH C04	Bath County 1-6
WAPA-2	WAPA_2_MSA_RapidCity_G	WAPA	2	2,405	813		OAHE	0
WEC-1	WEC_1_MSA_Chicago_G	WEC	1	1,728	303		PL PRA01	Pleasant Prairie 1
WEC-3	WEC_3_MSA_Milwaukee_G	WEC	3	1,429	2,423		DIESWI01	Valley 3
WEC-7	WEC_7_MSA_Milwaukee_G	WEC	7	3,850	3,052		PT BEA02	Point Beach 2
WEPL-7	WEPL_7_MSA_DodgeCity_G	WEPL	7	137	124		J. LAR04	Judson Large
WERE-1	WERE_1_MSA_Manhattan_G	WERE	11	2,988	409		JEFFRE01	Jeffrey EC 1
WERE-4	WERE_4_GEN_Wolfcreek_G	WERE	4	3,510	2,459		WOLF C01	Wolfcreek
WERE-5	WERE_5_MSA_KansasCity_L	WERE	5	204	915		LAWREN04	Lawrence EC 4
WFEC-7	WFEC_7_MSA_Woodward_G	WFEC	7	342	193		MOOREL02	Mooreland 2
WPS-4	WPS_4_MSA_Marshfield_L	WPS	4	411	442		NGCONSIL	NUG Consolidated Paper
XEL-3	XEL_3_MSA_Minneapolis_G	XEL	3	7,596	7,622		SHERBU03	Sherburne Co 3
YAD-1	YAD_1_MSA_Albemarle_G	YAD	1	13	4	3	DUKEHY01	0

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413		20.03	-2,198	1
	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	20.86	-1,865	2
	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	19.55	-1,421	3
	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	24.14	-1,344	
	IESO_11_G	8784	9,529	12,779	-3,007	-6,111	44.34	17.06	-1,171	5
	NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	19.67	-1,104	6
FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	24.03	-1,053	7
	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,115	-3,574	50.47	17.76	-937	8
FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,856	-3,553	57.11	18.72	-931	9
PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,730	-2,599	60.40	22.76	-918	10
MISO	CIN_1_MSA_Indianapolis_L	8784	816	4,274	-2,181	-3,310	43.40	16.91	-831	11
MISO	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,072	-4,218	45.13	17.50	-822	12
SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	50.79	17.62	-816	
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,807	-2,983	50.78	17.72	-806	
NEPOOL	NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,898	63.65	15.74	-759	15
FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335	58.48	19.77	-756	16
MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,652	-2,690	51.03	21.34	-740	17
NEPOOL	NEPOOL_6_WCMA	8643	4,285	3,417	-1,343	-3,453	63.68	15.83	-739	18
TVAUTHOR	TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	18.90	-655	19
PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	17.89	-638	20
TVAUTHOR	TVA_7_MSA_Memphis_L	8773	7,215	5,982	-1,502	-4,034	47.91	16.64	-631	21
PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	20.07	-628	22
PJM	PSEG_8_MSA_NewYork_G	8784	3,860	3,654	-1,122	-2,398	62.55	21.22	-617	23
PJM	AEP_9_MSA_Canton-Massillon_L	8784	733	2,120	-1,481	-2,058	44.99	16.21	-585	24
SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,302	-2,646	50.79	17.60	-581	25
PJM	PSEG 5 MSA Philadelphia L	8784	2,143	2,766	-1,072	-2,213	61.65	20.70	-580	26
VACAR	SCPSA 2 MSA Charleston L	8784	1,607	3,236	-1,215	-2,649	52.70	19.43	-562	27
PJM	DPL_3_MSA_Dayton_L	8784	1,350	2,652	-1,370	-2,435	44.89	16.77	-540	28
ENTERGY	EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,227	-1,983	48.92	16.12	-527	29
PJM	PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-951	-1,856	62.39	21.05	-521	30
FRCC	FPL 2 MSA FortMyers G	8506	5,929	4,563	-1,034	-2,343	59.29	21.26	-521	31
	TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,209	-2,885	47.93	17.73	-509	32
FRCC	TECO 7 MSA Tampa L	8784	-	1,481	-951	-2,004	58.75	19.97	-491	33
MISO	FE_4_MSA_Akron_L	8784	531	2,277	-1,227	-1,849	45.16	18.05	-487	34
	SOCO 8 MSA Atlanta L	8784	-	1,925	-1,065	-1,811	50.79	17.63	-475	35
PJM	JCPL_1_MSA_NewYork_L	8784	_	1,792	-862	-1,934	62.32	21.08	-472	36
PJM	PEPCO_1_MSA_DC_L	8784	_	1,439	-847	-1,492	61.10		-455	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	NYISO_9_NYI	8467	2	1,476	-786	-1,993		17.32	-445	
	IESO_3_L	8784	39	1,696	-1,140	-1,571	44.33	17.01	-444	39
	IESO_2_G	8711	2,437	2,116	-1,116	-1,779	45.33	17.02	-441	40
PJM	AP_2_GEN_Albright3_L	8784	603	1,748	-1,036	-1,695	47.70	16.12	-434	
SPP	OKGE_4_MSA_OklahomaCity_L	8783	2,102	2,403	-809	-1,550	59.89	22.89	-426	
PJM	AP_8_MSA_DC-VA-MD_L	8784	-	1,097	-798	-1,144	60.64	23.62	-425	
	BGE_5_MSA_Baltimore-Towson_L	8784	263	1,462	-750	-1,299	60.83	21.83	-401	44
	ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	17.36	-396	
	SOCO_21_MSA_Atlanta_G	8765	3,334	2,733	-888	-1,940	50.72	17.48	-395	
	NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	16.65	-392	
MISO	FE_8_MSA_Youngstown_L	8784	939	2,217	-998	-1,539	44.61	17.66	-391	48
PJM	BGE_9_MSA_Baltimore-Towson_L	8784	-	1,186	-681	-1,226	61.38	22.60	-367	49
PJM	JCPL_3_MSA_NewYork_L	8784	1,315	2,735	-672	-1,985	62.09	20.91	-366	
PJM	PL_5_MSA_Lancaster_L	8784	-	897	-660	-951	61.88	28.08	-359	
MISO	LGEE_9_MSA_Louisville_G	8784	1,136	1,763	-957	-1,746	42.33	16.84	-356	
PJM	AP_7_MSA_Hagerstown-Martinsburg	8784	203	1,153	-661	-1,009	59.93	22.97	-348	
PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-643	-1,025	60.45	20.08	-341	54
PJM	VAP_27_MSA_DC_L	8784	-	1,048	-641	-1,075	60.24	22.32	-339	
PJM	AEP_3_MSA_Columbus_L	7772	10,204	8,244	-999	-3,023	43.57	16.22	-338	
NYPP	NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	16.24	-337	57
PJM	PECO_8_MSA_Philadelphia_L	8784	399	1,064	-591	-918	61.39	20.57	-319	58
MISO	CIN_7_MSA_Lafayette_L	8784	144	1,712	-851	-1,422	41.48	17.13	-310	59
PJM	BGE_10_MSA_Baltimore-Towson_L	8784	845	1,565	-571	-1,411	60.97	21.99	-306	60
MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-758	-1,367	45.73	17.51	-305	61
SOUTHERN	SOCO_6_MSA_Augusta-Richmond_L	8784	-	1,187	-657	-1,116	50.70	17.47	-293	62
MISO	GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,007	-1,827	32.63	20.92	-289	63
PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	19.31	-288	64
NYPP	NYISO_2_NYB	8784	650	1,759	-710	-1,588	46.16	16.17	-288	65
	IPL_5_MSA_Indianapolis_L	8784	306	1,187	-750	-1,193	43.47	16.87	-286	66
	SOCO 10 MSA Albany-Valdosta L	7519	3,431	4,125	-701	-2,899	54.12	16.09	-285	67
ENTERGY	EES_3_MSA_Beaumont-PortArthur_L	8784	265	1,099	-606	-999	50.73	15.32	-270	68
PJM	PEPCO 4 MSA DC L	8784	-	825	-486	-856	61.29	22.92	-262	69
MISO	FE_7_MSA_Toledo_L	8778	2,586	2,106	-665	-1,149	44.52	17.66	-260	
	BGE 8 MSA Baltimore-Towson L	8784	-	840	-482	-868	61.22	22.51	-259	
MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	40.84	17.09	-257	72
SPP	KACP 7 MSA KansasCity L	8784	-	1,291	-691	-1,351	40.59	21.60	-246	
PJM	AE_7_MSA_OceanCity_G	8784	90	836	-424	-884	61.69	20.74		

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MAPP	OPPD_5_MSA_Omaha_L	8784	480	1,686	-847	-1,521	30.69	21.18	-228	
	LGEE_8_L	8784	33	771	-540	-908	47.80	18.97	-227	76
PJM	PEPCO_5_MSA_DC_L	8784	-	710	-418	-737	61.27	22.63	-225	77
PJM	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	39.52	20.34	-220	
VACAR	CPLE_9_MSA_NewBern_L	8784	53	811	-471	-757	52.70	19.41	-218	
PJM	PEPCO_7_MSA_DC_L	8784	-	655	-385	-679	61.25	22.61	-207	80
	METC_8_MSA_BayCity_G	8326	3,795	2,562	-544	-1,369	44.80	16.75	-203	
	DUK_4_MSA_Greenville_L	6816	3,546	4,489	-587	-2,021	50.52	18.52	-202	82
	NYISO_5_NYE	8757	1,098	909	-392	-821	58.73	13.83	-201	83
MISO	FE_10_MSA_Mansfield_L	8784	46	859	-508	-799	45.13	16.49	-201	84
	IPL_8_MSA_Indianapolis_L	8784	547	1,227	-521	-1,304	43.52	16.96	-199	
MISO	CIN_4_MSA_Cincinnati-Middletown_0	6965	6,026	5,727	-652	-2,757	43.50	17.51	-197	86
	TVA_10_MSA_Grenada_L	8784	-	651	-457	-721	48.72	16.49	-196	
SPP	AEPW_1_MSA_Tulsa_G	7434	3,295	2,000	-603	-1,182	42.10	14.71	-189	
	AECI_3_L	8784	-	915	-469	-881	45.54	17.74	-188	
	PECO_5_MSA_Philadelphia_L	6653	1,656	2,510	-406	-2,442	68.54	16.86	-185	
PJM	PSEG_6_MSA_NewYork_L	8784	-	639	-315	-657	64.28	22.70	-178	
MISO	XEL_3_MSA_Minneapolis_G	4672	7,596	7,622	-853	-2,783	43.84	20.09	-175	
SPP	WFEC_7_MSA_Woodward_G	8784	342	193	-327	-546	59.13	20.09	-170	
NEPOOL	NEPOOL_10_RI	6570	2,062	2,203	-406	-1,222	62.60	17.05	-167	94
SOUTHERN	SOCO_22_MSA_Atlanta_L	8784	41	661	-365	-621	50.89	17.66	-163	95
MISO	FE_5_MSA_Cleveland_L	6473	3,216	4,680	-517	-2,089	48.67	16.95	-163	
VACAR	SCEG_9_MSA_Charleston_G	8494	1,152	1,944	-360	-1,540	51.74	18.36	-158	
ENTERGY	EES_7_MSA_Beaumont-PortArthur_0	6739	7,393	4,949	-473	-1,685	49.15	16.92	-157	98
MISO	WEC_7_MSA_Milwaukee_G	8069	3,850	3,052	-556	-1,659	34.50	16.98	-155	99
PJM	DP&L_6_MSA_Seaford_L	8407	1,438	1,523	-288	-883	62.21	20.94	-150	100
PJM	DLCO_1_MSA_Pittsburgh_L	8784	-	635	-399	-641	42.24	16.87	-148	101
SOUTHERN	SOCO_17_MSA_Mobile_G	6709	5,205	4,575	-434	-1,703	49.65	16.57	-145	102
ENTERGY	EES_9_MSA_Russellville_G	6251	6,123	4,517	-444	-1,630	49.53	14.67	-137	103
	AECI_9_L	8784	-	694	-356	-668	42.23	16.03	-132	104
MISO	SIGE 9 MSA Evansville L	8784	159	774	-317	-572	43.67	20.40	-122	105
PJM	METED 4 MSA Reading G	7571	913	854	-272	-557	58.40	20.54	-120	106
PJM	VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	28.29	-118	107
	AECI 7 MSA KansasCity L	8784	-	615	-315	-592	41.06	17.48	-114	
	METC 4 MSA Holland-GrandHaven	3005	7,365	2,900	-1,052	-2,906	34.41	15.06	-109	
	MP 7 MSA Duluth L	8784	514	824	-490	-761	24.19	13.69	-104	
	NEPOOL 8 SWCT	5935	2,678	1,850	-267	-951	61.74	16.98	-98	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

								<b>.</b>	-	Rank
			Gen	Load	Avg net	Max Net	Б.	Price	Revenue	based on
NA - 1 - 1 A	II I Ni.	0:1111	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	WERE_5_MSA_KansasCity_L	8783	204	915	-276	-710	40.32	22.08	-98	
	WERE_4_GEN_Wolfcreek_G	3653	3,510	2,459	-485	-1,564	55.01	20.08	-97	113
	OTP_1_L	8784	-	640	-412	-659	25.43	13.46	-92	114
	SMEPA_5_MSA_Laurel_G	8784	341	184	-204	-366	51.33	18.01	-92	
	PECO_1_MSA_Philadelphia_G	6543	2,323	554	-221	-389	57.37	20.38	-83	
	EES_4_GEN_Ouachita_G	3366	6,345	2,417	-599	-1,371	40.60	12.95	-82	
	DOE_2_MSA_Paducah_G	8784	520	309	-190	-299	43.83	17.72	-73	
	NPPD_7_L	8784	210	975	-357	-707	22.57	12.70	-71	119
MISO	WEC_3_MSA_Milwaukee_G	6898	1,429	2,423	-264	-1,143	37.53	17.43	-68	
	NEPOOL_3_ME	4861	3,494	2,522	-227	-1,154	55.19	13.82	-61	121
	NPPD_1_MSA_GrandIsland_L	8784	376	983	-419	-793	16.32	12.81	-60	
	AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	17.89	-55	
MISO	WPS_4_MSA_Marshfield_L	8774	411	442	-158	-288	36.60	19.97	-51	124
	TVA_9_MSA_Paducah_G	4950	4,470	2,130	-176	-674	49.00	20.07	-43	
PJM	VAP_26_MSA_DC_G	4856	1,981	631	-162	-441	51.84	20.74	-41	126
	SUNC_3_MSA_GardenCity_G	6623	840	18	-159	-229	36.62	17.11	-38	
	NEPOOL_1_VT	3678	821	1,115	-149	-637	68.87	15.46	-38	
	MGE_7_MSA_Madison_L	7111	399	403	-144	-269	30.65	17.60	-31	129
PJM	RECO_1_MSA_NewYork_L	8784	-	146	-57	-137	62.41	20.00	-31	130
	SPS_2_GEN_Tolk1_G	4407	4,480	2,973	-96	-289	72.41	16.88	-31	131
SPP	OMPA_9_MSA_PoncaCity_G	7879	163	147	-50	-127	65.00	20.84	-26	132
	NEPOOL_7_CT	1143	4,447	3,920	-296	-1,008	73.88	11.03	-25	
MAPP	WAPA_2_MSA_RapidCity_G	5489	2,405	813	-248	-389	18.06	11.12	-25	
	WEPL_7_MSA_DodgeCity_G	8775	137	124	-59	-112	43.39	20.76	-23	135
MISO	CIN_3_MSA_TerreHaute_G	1750	3,230	1,015	-354	-588	34.37	14.09	-21	136
SPP	LEPA_5_MSA_Houma-Bayou_G	8784	93	73	-39	-74	52.15	18.32	-18	137
VACAR	DUK_5_MSA_Seneca_G	1596	1,911	-	-320	-1,100	32.81	8.43	-17	138
NYPP	NYISO_4_NYD	1203	1,206	681	-277	-952	50.00	15.59	-17	139
SPP	AEPW_9_MSA_MountPleasant_G	1108	8,168	3,832	-303	-1,116	47.31	9.14	-16	140
	LES_5_MSA_Lincoln_G	8463	264	108	-55	-103	33.57	22.25	-16	141
ENTERGY	DENL_7_MSA_LittleRock_L	8784	-	81	-35	-81	46.81	15.69	-14	142
	SOCO 32 MSA Pascagoula G	1253	3,574	2,674	-240	-1,091	47.76	15.69	-14	143
	NYISO 6 NYF	1315	4,103	1,983	-191	-1,000	56.90	15.17	-14	
MISO	CWLP 1 MSA Springfield G	4853	310	227	-99	-184	29.60	12.02	-14	
	CPLE_1_MSA_Durham_G	941	10,224	8,563	-313	-1,346	47.67	18.69	-14	
	MIDW 7 MSA Hays L	8784	19	92	-40	-93	40.19	18.92	-14	
	BGE 7 MSA Baltimore-Towson G	790	2,548	1,043	-342	-676	51.82	21.58	-14	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

			0		A	M. N.		<b>D</b> :		Rank
			Gen	Load	Avg net	Max Net	ъ.	Price	Revenue	based on
Manhat Anaa	Hale Nieuwe	Oirele I Irre	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	UPPC_9_MSA_Houghton_L	8784	2 75	75	-40	-63 -52	38.81	20.17	-13	
	DERS_1_MSA_Ruston_G	8507	_	68	-31		48.96	15.67	-13	
	EES_10_MSA_Vicksburg_G	696	3,544	1,249	-364	-825	50.32	15.84	-13	
	IESO_15_G	402	1,964	3,375	-665	-1,185	44.04	11.44	-12	
	AEPW_5_MSA_Tulsa_G	1358	4,226	2,571	-158	-626	51.63	15.66	-11	153
	SCEG_1_MSA_Columbia_G	816	4,954	2,752	-346	-1,094	37.54	11.42	-11	154
	MEC_3_MSA_DesMoines_G	793	3,307	1,933	-332	-663	38.49	17.96	-10	
	RCU_6_MSA_Orlando_L	8784	-	38	-20	-35	57.19		-10	
	NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,221	45.80	20.07	-10	
	EMDE_1_MSA_Joplin_G	2889	1,102	458	-81	-296	39.63	17.53	-9	
	PL_8_MSA_Allentown_G	1886	2,853	385	-77	-188	61.28	20.41	-9	
	CWLD_2_MSA_Columbia_L	8784	-	48	-25	-46	40.98	17.94	-9	
	GRDA_2_G	1045	849	179	-207	-446	40.34	12.76	-9	
	MIPU_7_MSA_KansasCity_G	4961	1,307	437	-59	-282	28.31	15.95	-8	
	SPRM_10_MSA_Springfield_L	2930	236	346	-40	-172	53.28	18.02	-6	
	SOCO_2_GEN_Hartwll_G	5955	2,186	46	-23	-36	44.64	16.66	-6	
	ALTW_6_MSA_CedarRapids_L	556	996	1,103	-185	-766	57.18	19.76	-6	
	FPC_10_MSA_Lakeland_G	763	3,561	747	-198	-399	38.67	12.29	-6	
	OVEC_3_G	7787	1,620	10	-17	-34	42.51	15.52	-6	
	NYISO_1_NYA	530	4,946	2,500	-287	-1,166	36.60	12.08	-6	
	STK_1_L	8784	-	17	-11	-18	56.85	18.80	-5	
	BCA_1_GEN_NRGBatesville_G	8038	87	14	-15	-23	44.90	14.81	-5	
	PENELEC_2_MSA_DuBois_G	448	2,724	1,196	-223	-740	51.81	16.79	-5	
	IP_8_GEN_Clinton_G	768	2,302	1,195	-154	-519	36.10	15.69	-4	
	NEPOOL_2_NH	358	4,204	2,621	-194	-816	52.75	10.77	-4	
	UGI_2_MSA_Scranton_G	8784	48	8	-6	-9	59.75	19.56	-3	174
SPP	CELE_10_MSA_Alexandria_G	230	1,895	742	-263	-379	49.37	22.55	-3	175
SOUTHERN	SOCO_28_MSA_Birmingham_G	168	2,535	1,090	-285	-359	56.42	16.31	-3	176
SPP	SWPA_2_MSA_MountainHome_G	3373	478	70	-25	-42	32.53	12.67	-3	177
PJM	NI_20_MSA_Chicago_G	1570	1,632	83	-42	-65	38.52	16.35	-3	178
MISO	SIPC_9_MSA_Marion-Herrin_G	2315	432	37	-29	-51	35.57	13.62	-2	179
	CILC_8_MSA_Peoria_G	771	756	349	-103	-193	26.44	11.36	-2	
	SOCO_15_MSA_Birmingham_G	113	12,464	9,217	-264	-772	64.79	12.55	-2	181
VACAR	CPLW_3_Asheville_G	972	764	93	-47	-67	41.03	14.91	-2	
	ALTE_2_MSA_Madison_G	168	1,665	441	-278	-363	31.35	13.01	-1	
	DPC_10_G	1014	615	140	-68	-115	17.25	4.75	-1	184
	TVA 4 MSA Clarksville G	168	2,544	150	-98	-137	45.50	17.47	-1	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	HE_9_MSA_TerreHaute_G	288	1,016	27	-36	-54	45.88	17.80	0	186
MISO	FE_9_MSA_Weirton_G	213	1,860	112	-55	-64	39.70	15.17	0	187
FRCC	GVL_3_MSA_Gainesville_G	1128	433	15	-7	-14		15.45	0	
	MPW_1_MSA_Muscatine_G	1445	151	16	-9	-13	25.51	15.37	0	
FRCC	OUC_1_MSA_Orlando_G	168	889	73	-34	-46	55.36	13.39	0	
FRCC	FPL_8_MSA_PortStLucie_G	21	10,364	4,623	-238	-521	45.23	17.27	0	
MISO	SMMPA_9_MSA_Rochester_G	8550	128	58	-1	-20	31.41	17.72	0	
FRCC	LWU_1_MSA_Miami_G	2192	250	82	-2	-3	48.93	23.93	0	193
FRCC	FMP_8_MSA_Sebastian_G	6965	145	20	0	-1	53.21	17.34	0	
PJM	DLCO_7_MSA_Pittsburgh_G	168	1,644	25	-17	-22	46.34	14.58	0	
MAPP	NPPD_4_GEN_Gentleman_G	24	2,702	148	-177	-209	31.06	14.09	0	196
FRCC	NSB_1_MSA_DaytonaBeach_G	1559	514	86	-2	-3	46.02	18.43	0	197
	KEY_1_MSA_KeyWest_G	540	880	138	-3	-5	59.80	18.02	0	
FRCC	LAK_1_MSA_Lakeland_G	190	819	28	-10	-14	42.02	17.43	0	199
VACAR	DUK_9_MSA_Charlotte_G	4	14,681	9,966	-90	-133	82.73	0.44	0	
SPP	WERE_1_MSA_Manhattan_G	13	2,988	409	-126	-163	16.05	6.72	0	201
	INDN_6_MSA_KansasCity_G	180	143	27	-5	-9	18.51	14.73	0	
	NIPS_8_MSA_Chicago_G	19	2,892	1,694	-27	-77	25.87	5.06	0	
	TVA_1_MSA_Chatt-Hunts_G	2	17,334	9,966	-173	-334		1.47	0	
	PEPCO_8_MSA_DC_G	1	3,786	1,108	-39	-39	73.90		0	
PJM	AEP_8_GEN_Amos01_G	1	19,694	6,544	-86	-86	29.90		0	
	SOCO_31_MSA_Atlanta_G	9	11,765	1,583	-9	-18	23.20	0.70	0	_
SOUTHERN	AEC_8_G	2	903	60	-2	-2	24.31	0.01	0	208
				<u> </u>						

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

			0		<b>A</b>	M. N.		<b>D</b> :		Rank
			Gen	Load	Avg net	Max Net	D. 1	Price	Revenue	based on
Manhat Ana	Link Name	Circle I Irra	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293		27.09	-2,732	
	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,386	-9,115	42.40	21.71	-2,006	
	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,952	-5,281	59.42	22.83	-1,541	3
FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	67.21	28.03	-1,469	
	NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	26.15	-1,407	5
	IESO_11_G	8784	9,529	12,779	-3,006	-6,111	47.22	20.10	-1,247	
	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15		-1,141	7
FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,857	-3,553	62.09	21.89	-1,013	
	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,097	-3,574	54.40	20.93	-1,002	
PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,729	-2,537	65.82	27.15	-999	
	NEPOOL_6_WCMA	8762	4,285	3,417	-1,506	-3,982	72.25	20.38	-953	
MISO	CIN_1_MSA_Indianapolis_L	8784	816	4,274	-2,181	-3,310	46.47	20.02	-890	
	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,073	-4,218	48.23	20.66		
	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	54.66	20.73	-878	
	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,808	-2,983	54.64	20.83	-868	
FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,476	-2,354	63.83	23.39	-827	16
MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,651	-2,733	54.41	24.32	-789	
	NEPOOL_4_NEBOS	8656	3,262	5,904	-1,161	-3,970	72.00	20.25	-724	
<b>TVAUTHOR</b>	TVA_5_MSA_Nashville_L	8531	9,154	8,858	-1,542	-4,313	53.67	22.14	-706	
PJM	PSEG_8_MSA_NewYork_G	8784	3,860	3,654	-1,121	-2,452	70.38		-693	
TVAUTHOR	TVA_7_MSA_Memphis_L	8769	7,215	5,982	-1,527	-4,177	51.66	19.70	-692	21
PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	20.59	-684	
PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	23.14	-678	
PJM	AEP_9_MSA_Canton-Massillon_L	8784	733	2,120	-1,491	-2,063	47.87	19.29	-627	24
SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,297	-2,646	54.66	20.71	-623	25
VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,203	-2,678	56.60	22.50	-598	
FRCC	FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	24.97	-584	27
PJM	PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-946	-1,857	70.18	26.73	-583	28
PJM	PSEG_5_MSA_Philadelphia_L	8784	2,143	2,766	-959	-1,990	68.62	25.93	-578	29
PJM	DPL_3_MSA_Dayton_L	8784	1,350	2,652	-1,354	-2,432	48.04	19.91	-571	30
ENTERGY	EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,220	-1,970	53.10	19.13	-569	31
TVAUTHOR	TVA 3 MSA Knoxville L	8784	3,684	5,102	-1,206	-2,885	51.80	20.82	-549	
FRCC	TECO_7_MSA_Tampa_L	8784	-	1,481	-951	-2,004	64.08	23.54	-535	
PJM	JCPL 1 MSA NewYork L	8784	-	1,792	-862	-1,934	70.02	26.72	-530	
	NYISO 9 NYI	8467	2	1,476	-786	-1,993	79.19	23.75	-527	35
	SOCO 8 MSA Atlanta L	8784	-	1,925	-1,065	-1,811	54.65	20.74	-511	36
	FE 4 MSA Akron L	8784	531	2,277	-1,209	-1,732	47.77	19.33	-507	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	PEPCO_1_MSA_DC_L	8784	-	1,439	-847	-1,492	66.76	27.62	-497	38
	IESO_3_L	8784	39	1,696	-1,140	-1,571	47.21	20.03	-473	
	IESO_2_G	8715	2,437	2,116	-1,113	-1,779	48.38	20.20	-469	
SPP	OKGE_4_MSA_OklahomaCity_L	8783	2,102	2,403	-821	-1,550	64.79	25.48	-467	41
PJM	AP_8_MSA_DC-VA-MD_L	8784	-	1,097	-798	-1,144	66.07	28.05	-463	
NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-696	-1,248	74.26	22.09	-454	
PJM	AP_2_GEN_Albright3_L	8784	603	1,748	-1,008	-1,587	51.03	19.51	-452	44
NYPP	NYISO_7_NYG	8388	3,156	2,195	-698	-1,444	74.41	22.44	-436	
PJM	BGE_5_MSA_Baltimore-Towson_L	8784	263	1,462	-733	-1,299	66.73	26.58	-429	
MISO	ITC_2_MSA_Detroit_L	8540	4,001	5,247	-1,016	-3,744	48.87	20.50	-424	
SOUTHERN	SOCO_21_MSA_Atlanta_G	8768	3,334	2,733	-858	-1,940	54.60	20.59	-411	48
MISO	FE_8_MSA_Youngstown_L	8784	939	2,217	-977	-1,515	46.99	19.90	-403	49
PJM	BGE 9 MSA Baltimore-Towson L	8784	-	1,186	-681	-1,226	67.28	27.38	-403	50
PJM	JCPL_3_MSA_NewYork_L	8784	1,315	2,735	-651	-1,985	69.48	26.37	-397	51
PJM	PL_5_MSA_Lancaster_L	8784	-	897	-660	-951	68.28	33.06	-396	52
MISO	LGEE 9 MSA Louisville G	8784	1,136	1,763	-959	-1,756	45.30	20.00	-382	53
PJM	AP_7_MSA_Hagerstown-Martinsburg	8784	203	1,153	-661	-1,009	65.25	27.27	-379	
PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-643	-1,025	66.98	25.04	(378)	
PJM	VAP_27_MSA_DC_L	8784	-	1,048	-641	-1,075	65.61	26.67	-369	56
PJM	PECO 8 MSA Philadelphia L	8784	399	1,064	-596	-952	68.18	25.70	-357	57
PJM	AEP 3 MSA Columbus L	7710	10,204	8,244	-968	-3,258	46.37	19.24	-346	58
PJM	BGE_10_MSA_Baltimore-Towson_L	8784	845	1,565	-572	-1,323	66.88	26.75	-336	59
MISO	CIN_7_MSA_Lafayette_L	8784	144	1,712	-851	-1,422	44.47	20.11	-332	60
MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-758	-1,367	48.95	20.76	-326	61
PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-594	-1,149	62.16	23.04	-324	62
SOUTHERN	SOCO_6_MSA_Augusta-Richmond_L	8784	-	1,187	-657	-1,116	54.61	20.61	-315	63
MISO	GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,007	-1,824	35.05	24.14	-310	64
MISO	IPL_5_MSA_Indianapolis_L	8784	306	1,187	-750	-1,193	46.54	20.00	-307	65
	NYISO 2 NYB	8784	650	1,759	-706	-1,572	48.73	19.51	-302	66
	EES_3_MSA_Beaumont-PortArthur_L	8784	265	1,099	-606	-999	55.24	18.53	-294	
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	7471	3,431	4,125	-662	-2,746	58.74	19.01	-290	68
PJM	PEPCO 4 MSA DC L	8784	-	825	-486	-856	67.06	27.57	-286	
PJM	BGE 8 MSA Baltimore-Towson L	8784	-	840	-482	-868	67.08		-284	
	FE 7 MSA Toledo L	8779	2,586	2,106	-673	-1,149	47.61	20.73	-281	71
MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	43.77	20.07	-276	
SPP	KACP 7 MSA KansasCity L	8784	-	1,291	-691	-1,351	43.73	25.02	-265	
PJM	AE 7 MSA OceanCity G	8784	90	836	-424	-884	68.66	25.97	-256	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net	ъ.	Price	Revenue	based on
N4 - 1 - 1 A	II I Nove	0: 1 11:	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MAPP	OPPD_5_MSA_Omaha_L	8784	480	1,686	-847	-1,503		24.60		75
PJM	PEPCO_5_MSA_DC_L	8784	-	710	-418	-737	67.11	27.35	-247	76
MISO	LGEE_8_L	8784	33	771	-539	-908	51.36	21.85	-243	77
PJM	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	42.36	21.55		
VACAR	CPLE_9_MSA_NewBern_L	8784	53	811	-471	-757	56.89	21.49		
PJM	PEPCO_7_MSA_DC_L	8784	-	655	-385	-679	67.08	27.31	-227	80
	METC_8_MSA_BayCity_G	8357	3,795	2,562	-547	-1,369	47.82	19.83	-219	81
	DUK_4_MSA_Greenville_L	6750	3,546	4,489	-589	-1,925	54.17	21.78	\ /	82
MISO	FE_10_MSA_Mansfield_L	8784	46	859	-508	-812	48.09	19.59		
MISO	IPL_8_MSA_Indianapolis_L	8784	547	1,227	-518	-1,286	46.60	20.09		84
	TVA_10_MSA_Grenada_L	8784	-	651	-457	-721	52.61	19.51	-211	85
	NYISO_5_NYE	8757	1,098	909	-365	-731	65.58	17.67	-210	86
SPP	AEPW_1_MSA_Tulsa_G	7440	3,295	2,000	-608	-1,182	45.99	17.17	(208)	87
PJM	PECO_5_MSA_Philadelphia_L	6595	1,656	2,510	-403	-2,442	77.26	21.02	-206	
PJM	PSEG_6_MSA_NewYork_L	8784	-	639	-315	-657	73.35	29.40	-203	89
ENTERGY	AECI_3_L	8784	-	915	-469	-881	49.28	20.42	-203	90
MISO	CIN_4_MSA_Cincinnati-Middletown_0	6874	6,026	5,727	-634	-2,757	46.29	20.89	-202	91
MISO	XEL_3_MSA_Minneapolis_G	4678	7,596	7,622	-853	-2,814	48.01	23.11	-192	92
ENTERGY	EES_7_MSA_Beaumont-PortArthur_0	7005	7,393	4,949	-489	-1,659	53.78	20.42	-184	93
SPP	WFEC_7_MSA_Woodward_G	8784	342	193	-327	-547	63.87	22.55	-184	94
SOUTHERN	SOCO_22_MSA_Atlanta_L	8784	41	661	-365	-621	54.72	20.74	-176	95
MISO	WEC_7_MSA_Milwaukee_G	8097	3,850	3,052	-563	-1,631	37.06	19.67	-169	96
MISO	FE_5_MSA_Cleveland_L	6258	3,216	4,680	-514	-2,089	52.20	18.76	-168	97
VACAR	SCEG_9_MSA_Charleston_G	8439	1,152	1,944	-355	-1,540	55.77	21.51	-167	98
PJM	DP&L_6_MSA_Seaford_L	8380	1,438	1,523	-279	-883	69.27	26.24	-162	99
PJM	DLCO_1_MSA_Pittsburgh_L	8784	-	635	-399	-641	44.67	19.86	-157	100
SOUTHERN	SOCO_17_MSA_Mobile_G	6738	5,205	4,575	-421	-1,892	53.83	19.67	-153	101
	EES_9_MSA_Russellville_G	6263	6,123	4,517	-444	-1,617	53.58	17.48	-149	102
	AECI 9 L	8784	-	694	-356	-668	45.46	18.80	-142	103
PJM	METED_4_MSA_Reading_G	7750	913	854	-277	-557	64.61	25.40	-138	104
MISO	SIGE_9_MSA_Evansville_L	8784	159	774	-317	-572	46.57	23.83	-130	105
PJM	VAP 7 G	1879	4,179	303	-1,021	-1,772	65.53	33.48	-126	106
NEPOOL	NEPOOL_8_SWCT	5755	2,678	1,850	-310	-984	69.61	22.37	-124	107
	AECI 7 MSA KansasCity L	8784	,	615	-315	-592	44.17	20.42	-122	108
	METC 4 MSA Holland-GrandHaven	3058	7,365	2,900	-1,041	-2,906	36.17	17.90	-115	109
NEPOOL	NEPOOL 10 RI	6111	2,062	2,203	-265	-926	70.17	22.21	-114	
MISO	MP_7_MSA_Duluth_L	8784	514	824	-488	-784	25.08	14.98		

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	WERE_4_GEN_Wolfcreek_G	3670	3,510	2,459	-486	-1,564	60.17	23.46	-107	112
	WERE_5_MSA_KansasCity_L	8783	204	915	-276	-710	43.32	25.45	-105	
	SMEPA_5_MSA_Laurel_G	8784	341	184	-204	-370	55.66	21.15	-100	
	OTP_1_L	8784	-	640	-412	-659	26.53	14.81	-96	
	PECO_1_MSA_Philadelphia_G	6720	2,323	554	-219	-404	63.54	25.69	-94	
	EES_4_GEN_Ouachita_G	3309	6,345	2,417	-591	-1,371	43.31	15.42	-85	
	DOE_2_MSA_Paducah_G	8784	520	309	-190	-299	47.15	20.80	-79	
	NPPD_7_L	8784	210	975	-357	-707	23.55	13.98	-74	
MISO	WEC_3_MSA_Milwaukee_G	6881	1,429	2,423	-261	-1,101	40.53	20.18	-73	
	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	20.97	-60	
	NEPOOL_3_ME	4436	3,494	2,522	-218	-1,038	61.25	18.16	-59	
	NPPD_1_MSA_GrandIsland_L	8784	376	983	-421	-793	16.01	12.56	-59	
MISO	WPS_4_MSA_Marshfield_L	8773	411	442	-158	-288	39.46	23.12	-55	
PJM	VAP_26_MSA_DC_G	5249	1,981	631	-161	-461	55.84	24.39		125
	TVA_9_MSA_Paducah_G	4963	4,470	2,130	-175	-709	52.74	23.33	-46	
	NEPOOL_1_VT	3678	821	1,115	-149	-637	77.54	15.35	-42	
	SUNC_3_MSA_GardenCity_G	6433	840	18	-159	-228	36.30	17.34	-37	128
SPP	SPS_2_GEN_Tolk1_G	4622	4,480	2,973	-100	-296	79.38	18.84	-37	
	RECO_1_MSA_NewYork_L	8784	-	146	-57	-137	70.84	26.08	-35	
	MGE_7_MSA_Madison_L	7315	399	403	-142	-266	33.33	20.36	-35	
NEPOOL	NEPOOL_7_CT	1106	4,447	3,920	-339	-1,095	87.32	14.24	-33	132
SPP	OMPA_9_MSA_PoncaCity_G	7949	163	147	-51	-127	71.29	23.72	-29	
MAPP	WAPA_2_MSA_RapidCity_G	5461	2,405	813	-247	-379	18.18	11.55	-25	134
MISO	WEPL_7_MSA_DodgeCity_G	8783	137	124	-60	-115	44.88	22.35	-23	135
MISO	CIN_3_MSA_TerreHaute_G	1740	3,230	1,015	-334	-588	35.88	16.44	-21	136
	DUK_5_MSA_Seneca_G	1675	1,911	-	-338	-1,100	33.94	10.31	-19	137
SPP	LEPA_5_MSA_Houma-Bayou_G	8784	93	73	-39	-74	56.60	21.46	-19	138
SOUTHERN	SOCO_32_MSA_Pascagoula_G	1396	3,574	2,674	-258	-1,156	51.96	18.04	-19	139
	NYISO_6_NYF	1254	4,103	1,983	-261	-1,145	54.41	20.08	-18	140
	LES_5_MSA_Lincoln_G	8381	264	108	-55	-103	35.74	25.45	-17	141
NYPP	NYISO 4 NYD	1122	1,206	681	-266	-952	52.91	20.82	-16	142
ENTERGY	DENL 7 MSA LittleRock L	8784	-	81	-35	-81	50.50	18.53	-16	
VACAR	CPLE_1_MSA_Durham_G	933	10,224	8,563	-324	-1,346	49.43	22.30	-15	
	MIDW_7_MSA_Hays_L	8784	19	92	-40	-90	42.14	21.14	-15	
	UPPC_9_MSA_Houghton_L	8784	2	75	-40	-63	41.86	25.33	-15	
MISO	CWLP_1_MSA_Springfield_G	4759	310	227	-99	-184	30.25	13.72	-14	
	EES 10 MSA Vicksburg G	696	3,544	1,249	-361	-825	55.59	19.12	-14	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	DERS_1_MSA_Ruston_G	8499	75	68	-31	-52	53.12	18.73	(\$111111011) -14	
	MEC 3 MSA DesMoines G	810	3,307	1,933	-352	-670	43.78	22.16	-14	150
VACAR	SCEG_1_MSA_Columbia_G	833	4,954	2,752	-355	-1,040	40.37	15.10	-12	151
	NI 6 MSA Chicago G	716	9,759	7,577	-320	-1,221	49.17	22.05	-12	152
FRCC	RCU_6_MSA_Crilcago_G	8784	3,733	38	-20	-1,221	62.19	21.91	-11	153
PJM	PL 8 MSA Allentown G	2056	2,853	385	-76	-188	69.31	25.70	-11	154
	BGE 7 MSA Baltimore-Towson G	572	2,548	1,043	-336	-583	54.82	27.98	-11	155
	IESO_15_G	399	1,964	3,375	-574	-1,177	45.64	13.75	-10	
SPP	AEPW 5 MSA Tulsa G	1306	4,226	2,571	-139	-822	56.81	18.17	-10	
SPP	AEPW 9 MSA MountPleasant G	806	8,168	3,832	-260	-972	49.15	12.13	-10	
	CWLD 2 MSA Columbia L	8784	0,100	48	-25	-46	44.05	20.95	-10	
SPP	GRDA 2 G	1083	849	179	-201	-451	43.73	15.84	-9	
	MIPU 7 MSA KansasCity G	5099	1,307	437	-60	-282	29.98	18.35	-9	
	EMDE_1_MSA_Joplin_G	2680	1,102	458	-80	-294	42.48	20.68	-9	
SPP	SPRM_10_MSA_Springfield_L	2927	236	346	-40	-172	59.23	19.77	-7	163
	ALTW 6 MSA CedarRapids L	554	996	1,103	-185	-766	64.24	22.92	-7	
	SOCO_2_GEN_Hartwll_G	5955	2,186	46	-23	-36	47.46	19.59	-7	165
PJM	OVEC 3 G	7998	1,620	10	-17	-34	45.61	18.35	-6	
FRCC	FPC_10_MSA_Lakeland_G	756	3,561	747	-197	-399	40.77	14.67	-6	
FRCC	STK 1 L	8784	-	17	-11	-18	61.75	22.05	-6	
	BCA_1_GEN_NRGBatesville_G	8021	87	14	-15	-22	48.32	17.42	-6	
	NYISO_1_NYA	512	4,946	2,500	-300	-1,246	34.45	11.40	-5	
MISO	IP 8 GEN Clinton G	769	2,302	1,195	-138	-484	37.99	18.16	-4	
PJM	PENELEC_2_MSA_DuBois_G	380	2,724	1,196	-175	-644	53.73	22.75	-4	172
PJM	UGI 2 MSA Scranton G	8784	48	8	-6	-9	65.98	24.35	-3	173
SOUTHERN	SOCO_28_MSA_Birmingham_G	168	2,535	1,090	-285	-359	60.58	19.01	-3	174
	CELE_10_MSA_Alexandria_G	221	1,895	742	-253	-379	51.56	24.62	-3	175
SOUTHERN	SOCO_15_MSA_Birmingham_G	161	12,464	9,217	-245	-772	72.85	14.68	-3	176
NEPOOL	NEPOOL_2_NH	265	4,204	2,621	-181	-1,019	57.99	12.28	-3	177
SPP	SWPA_2_MSA_MountainHome_G	3306	478	70	-25	-42	34.23	15.00	-3	178
PJM	NI_20_MSA_Chicago_G	1560	1,632	83	-42	-65	40.58	18.58	-3	179
MISO	SIPC_9_MSA_Marion-Herrin_G	2118	432	37	-29	-53	36.19	15.74	-2	
MISO	CILC_8_MSA_Peoria_G	748	756	349	-103	-193	27.49	13.28	-2	
VACAR	CPLW_3_Asheville_G	815	764	93	-46	-67	41.80	17.59	-2	182
MISO	ALTE_2_MSA_Madison_G	168	1,665	441	-278	-363	32.62	14.51	-2	
	DPC_10_G	993	615	140	-66	-115	17.18	4.97	-1	184
TVAUTHOR	TVA_4_MSA_Clarksville_G	168	2,544	150	-98	-137	49.65	21.42	-1	185

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario HighCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	FPL_8_MSA_PortStLucie_G	37	10,364	4,623	-315	-613	42.76	17.44	0	186
MISO	HE_9_MSA_TerreHaute_G	288	1,016	27	-36	-54	47.78	19.66	0	187
	GVL_3_MSA_Gainesville_G	1128	433	15	-7	-14	57.95	18.01	0	188
	FE_9_MSA_Weirton_G	174	1,860	112	-56	-64	39.22	16.12	0	189
	MPW_1_MSA_Muscatine_G	1455	151	16	-9	-13	26.36	16.79	0	
FRCC	OUC_1_MSA_Orlando_G	168	889	73	-34	-46	59.10	15.35	0	191
MISO	SMMPA_9_MSA_Rochester_G	8553	128	58	-1	-20	33.57	20.27	0	192
	LWU_1_MSA_Miami_G	2151	250	82	-2	-3	52.29	27.77	0	193
	FMP_8_MSA_Sebastian_G	6948	145	20	0	-1	57.35	19.98	0	
	DLCO_7_MSA_Pittsburgh_G	168	1,644	25	-17	-22	50.05	18.48	0	195
	NPPD_4_GEN_Gentleman_G	24	2,702	148	-172	-209	33.17	15.64	0	
	NSB_1_MSA_DaytonaBeach_G	1585	514	86	-2	-3	48.63	21.60	0	.01
	KEY_1_MSA_KeyWest_G	537	880	138	-3	-5	64.29	20.91	0	
	LAK_1_MSA_Lakeland_G	190	819	28	-10	-14	43.67	19.44	0	199
	WERE_1_MSA_Manhattan_G	31	2,988	409	-127	-162	17.42	10.59	0	
	DUK_9_MSA_Charlotte_G	4	14,681	9,966	-90	-133	92.97	0.77	0	
	NIPS_8_MSA_Chicago_G	20	2,892	1,694	-43	-144		7.83	0	
	INDN_6_MSA_KansasCity_G	199	143	27	-5	-9		15.99	0	
	TVA_1_MSA_Chatt-Hunts_G	2	17,334	9,966	-173	-334	28.84	2.03	0	204
	SOCO_31_MSA_Atlanta_G	13	11,765	1,583	-27	-78	23.02	0.47	0	
	AEP_8_GEN_Amos01_G	2	19,694	6,544	-96		32.51	3.07	0	
MISO	CIN_8_MSA_Evansville_G	1	3,657	260	-106	-106	27.90		0	
	PEPCO_8_MSA_DC_G	1	3,786	1,108	-39	-39	74.77		0	
	AECI_4_GEN_NewMadrid1_G	3	2,315	248	-5	-9	50.43	5.78	0	
SOUTHERN	AEC_8_G	3	903	60	-2	-4	23.78	0.49	0	210

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

								5.	_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	14.63	-1,833	
	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,262	-9,151	32.96	12.46	-1,524	2
	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	13.15	-1,128	3
	FPL_7_MSA_Miami_L	8784	570	3,923	-2,490	-4,080	48.68	16.28	-1,065	
	IESO_11_G	8784	9,529	12,779	-3,004	-6,111	37.70	10.60	-995	5
	NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62	14.13	-930	6
	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,232	-3,594	42.59	11.58	-835	7
	FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65	16.21	-817	8
FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,853	-3,468	45.78		-745	
PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,704	-2,478	49.31	14.44	-738	10
MISO	CIN_1_MSA_Indianapolis_L	8784	816	4,274	-2,176	-3,301	37.20	10.63	-711	11
MISO	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,072	-4,218	38.20	11.07	-695	12
SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	11.24	-682	13
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,790	-2,847	42.52	11.39	-668	14
MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,654	-2,693	43.24	13.72	-628	15
NEPOOL	NEPOOL_6_WCMA	8707	4,285	3,417	-1,409	-3,954	50.54	10.90	-620	16
FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,477	-2,349	46.91	13.33	-609	17
PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	11.03	-553	18
NEPOOL	NEPOOL_4_NEBOS	8631	3,262	5,904	-1,262	-3,970	50.39	10.70	-549	19
TVAUTHOR	TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	11.62	-538	20
PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	13.09	-537	21
PJM	PSEG_5_MSA_Philadelphia_L	8784	2,143	2,766	-1,186	-2,037	50.63	13.43	-528	22
SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,410	-2,740	42.42	11.19	-526	
VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,307	-2,681	44.75	13.56	-514	24
PJM	DPL 3 MSA Dayton L	8784	1,350	2,652	-1,441	-2,435	38.46	10.53	-487	25
PJM	AEP 9 MSA Canton-Massillon L	8784	733	2,120	-1,414	-2,058	38.80	10.30	-482	26
PJM	PSEG 8 MSA NewYork G	8779	3,860	3,654	-1,066	-2,403	51.21	13.83	-479	27
TVAUTHOR	TVA_7_MSA_Memphis_L	8725	7,215	5,982	-1,376	-4,095	39.25	10.06	-471	28
MISO	FE_4_MSA_Akron_L	8784	531	2,277	-1,274	-1,904	39.21	10.66	-439	29
	EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,233	-2,026	39.26	9.89	-425	30
	TVA 3 MSA Knoxville L	8784	3,684	5,102	-1,211	-2,885	39.10	11.32	-416	31
	SOCO 21 MSA Atlanta G	8776	3,334	2,733	-1,117	-2,055	42.33	11.07	-415	32
FRCC	FPL_2_MSA_FortMyers_G	8464	5,929	4,563	-1,018	-2,545	47.39	14.26	-408	
	AP 2 GEN Albright3 L	8784	603	1,748	-1,114	-1,695	41.10	9.89	-402	34
	SOCO 8 MSA Atlanta L	8784	-	1,925	-1,065	-1,811	42.46	11.26	-397	35
PJM	PSEG 3 MSA NewYork L	8784	1,843	2,275	-879	-1,841	51.11	13.69	-395	36
FRCC	TECO_7_MSA_Tampa_L	8784	-,5 10	1,481	-951	-2,004		13.46	-394	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AEP 3 MSA Columbus L	8356	10,204	8,244	-1,210	-3,226	38.35	10.44	-388	
PJM	JCPL 1 MSA NewYork L	8784		1,792	-862	-1,934	51.10	13.75	-387	39
	IESO 3 L	8784	39	1,696	-1,140	-1,571	37.68	10.54	-377	40
MISO	FE_8_MSA_Youngstown_L	8784	939	2,217	-1,108	-1,570	38.56	11.05	-375	
PJM	PEPCO_1_MSA_DC_L	8784	-	1,439	-847	-1,492	50.14	14.71	-373	
ONTARIO	IESO 2 G	8692	2,437	2,116	-1,089	-1,779	38.42	10.60	-364	
	NYISO_9_NYI	8467	2	1,476	-786	-1,993	54.32	12.63	-362	44
PJM	BGE 5 MSA Baltimore-Towson L	8784	263	1,462	-806	-1,325	50.17	13.95	-355	45
PJM	AP_8_MSA_DC-VA-MD_L	8784	-	1,097	-798	-1,144	49.61	15.15	-348	46
MISO	ITC_2_MSA_Detroit_L	8538	4,001	5,247	-1,016	-3,744	38.53	10.98	-334	47
NYPP	NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	11.33	-320	48
SPP	OKGE_4_MSA_OklahomaCity_L	8773	2,102	2,403	-781	-1,550	46.32	15.47	-317	49
NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-692	-1,141	51.52	11.71	-313	
MISO	LGEE_9_MSA_Louisville_G	8784	1,136	1,763	-959	-1,773	36.72	10.62	-309	51
PJM	BGE_9_MSA_Baltimore-Towson_L	8784	-	1,186	-681	-1,226	50.49	14.42	-302	52
PJM	PL_5_MSA_Lancaster_L	8784	-	897	-660	-951	51.59	22.55	-299	53
PJM	JCPL_3_MSA_NewYork_L	8784	1,315	2,735	-663	-1,960	50.92	13.59	-297	54
PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-654	-1,025	49.98	13.09	-287	55
PJM	AP_7_MSA_Hagerstown-Martinsburg	8784	203	1,153	-662	-1,009	49.08	14.61	-285	
PJM	VAP_27_MSA_DC_L	8784	-	1,048	-641	-1,075	49.20	14.11	-277	57
MISO	CIN_7_MSA_Lafayette_L	8784	144	1,712	-851	-1,422	35.30	10.90	-264	
MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-760	-1,339	38.86	10.91	-260	
PJM	PECO_8_MSA_Philadelphia_L	8784	399	1,064	-581	-918	50.47	13.34	-258	
	BGE_10_MSA_Baltimore-Towson_L	8784	845	1,565	-578	-1,460	50.26	14.05	-255	
	NYISO_2_NYB	8784	650	1,759	-706	-1,571	39.58	9.58	-245	
MISO	IPL_5_MSA_Indianapolis_L	8784	306	1,187	-749	-1,183	37.31	10.63	-245	63
	SOCO_10_MSA_Albany-Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	10.14	-244	
	SOCO_6_MSA_Augusta-Richmond_L	8784	-	1,187	-657	-1,116	42.27	11.04	-244	
MISO	GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,008	-1,827	27.10	14.00	-240	
MISO	CIN_4_MSA_Cincinnati-Middletown_0	7772	6,026	5,727	-765	-2,785	38.09	11.00	-226	
MISO	AMRN_2_County_Macon_L	8784	174	1,209	-716	-1,132	34.55	11.00	-217	68
PJM	PEPCO_4_MSA_DC_L	8784	-	825	-486	-856	50.34	14.61	-215	
	EES_3_MSA_Beaumont-PortArthur_L	8784	265	1,099	-604	-1,010	40.41	9.34	-215	
	BGE_8_MSA_Baltimore-Towson_L	8784	-	840	-482	-868	50.36	14.35	-213	
PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-494	-1,149	47.17	12.07	-205	
SPP	KACP_7_MSA_KansasCity_L	8784	-	1,291	-691	-1,351	33.63	13.78	-204	
MISO	FE_7_MSA_Toledo_L	8768	2,586	2,106	-624	-1,149	37.26	11.39	-204	74

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	LGEE_8_L	8784	33	771	-541	-908	40.05	11.85	-190	75
	AE_7_MSA_OceanCity_G	8784	90	836	-424	-884	50.65	13.44	-189	76
MAPP	OPPD_5_MSA_Omaha_L	8784	480	1,686	-848	-1,521	24.99	13.92	-186	77
VACAR	DUK_4_MSA_Greenville_L	6956	3,546	4,489	-618	-2,091	43.29	12.26	-186	
PJM	PEPCO_5_MSA_DC_L	8784	-	710	-418	-737	50.37	14.43	-185	79
	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	32.98	12.33	-184	80
VACAR	CPLE_9_MSA_NewBern_L	8784	53	811	-471	-757	44.00	11.74	-182	81
	SOCO_17_MSA_Mobile_G	7680	5,205	4,575	-584	-2,068	40.12	9.64	-180	82
	FE_10_MSA_Mansfield_L	8784	46	859	-508	-799	38.79	10.42	-173	83
MISO	IPL_8_MSA_Indianapolis_L	8784	547	1,227	-522	-1,286	37.35	10.71	-171	84
PJM	PEPCO_7_MSA_DC_L	8784	-	655	-385	-679	50.35	14.40	-170	85
	METC_8_MSA_BayCity_G	8119	3,795	2,562	-538	-1,369	37.60	10.04	-164	86
PJM	PECO_5_MSA_Philadelphia_L	6985	1,656	2,510	-424	-2,442	54.27	11.46	-161	87
	TVA_10_MSA_Grenada_L	8784	-	651	-457	-721	39.77	9.98	-160	88
	DP&L_6_MSA_Seaford_L	8665	1,438	1,523	-362	-1,039	50.74	13.48	-159	89
	FE_5_MSA_Cleveland_L	6639	3,216	4,680	-553	-2,419	42.00	10.27	-154	90
	AECI_3_L	8784	-	915	-469	-881	36.75	10.65	-151	91
VACAR	SCEG_9_MSA_Charleston_G	8611	1,152	1,944	-401	-1,540	43.63	12.30	-151	92
	NYISO_5_NYE	8764	1,098	909	-363	-766	46.85	8.93	-149	93
PJM	PSEG_6_MSA_NewYork_L	8784	-	639	-315	-657	52.33	14.83	-145	94
MISO	XEL_3_MSA_Minneapolis_G	4678	7,596	7,622	-853	-2,814	34.89	13.19	-139	95
	SOCO_22_MSA_Atlanta_L	8784	41	661	-365	-621	42.58	11.33	-137	96
SPP	WFEC_7_MSA_Woodward_G	8784	342	193	-325	-547	45.84	14.01	-131	97
PJM	DLCO_1_MSA_Pittsburgh_L	8784	-	635	-399	-641	36.91	11.02	-129	98
	AEPW_1_MSA_Tulsa_G	7156	3,295	2,000	-556	-1,182	32.47	8.71	-129	99
	NEPOOL_10_RI	6243	2,062	2,203	-366	-1,145	49.72	11.41	-114	100
	EES_9_MSA_Russellville_G	6307	6,123	4,517	-450	-1,630	39.49	9.10	-112	101
MISO	WEC_7_MSA_Milwaukee_G	7702	3,850	3,052	-503	-1,514	28.25	10.89	-109	102
	AECI_9_L	8784	-	694	-356	-668	34.75	10.04	-109	103
	EES_7_MSA_Beaumont-PortArthur_0	6142	7,393	4,949	-435	-1,610	39.49	10.69	-105	104
MISO	SIGE_9_MSA_Evansville_L	8784	159	774	-317	-564	37.77	13.31	-105	105
	AECI_7_MSA_KansasCity_L	8784	-	615	-315	-592	33.97	11.18	-94	106
	MP_7_MSA_Duluth_L	8784	514	824	-491	-781	21.53	9.30	-93	107
	METED_4_MSA_Reading_G	6649	913	854	-269	-591	48.07	13.94	-86	108
	NEPOOL_8_SWCT	5871	2,678	1,850	-285	-937	49.10	11.08	-82	109
MISO	OTP_1_L	8784	-	640	-412	-659	22.40	9.29	-81	110
SPP	WERE_5_MSA_KansasCity_L	8783	204	915	-271	-710	33.74	14.27	-80	111

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

			Cara	Lood	Augunat	May Net		Drice	Davisson	Rank
			Gen	Load	Avg net	Max Net	Duine	Price	Revenue	based on
Morket Area	Llub Nama	Circle I Irra	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name METC 4 MSA Holland-GrandHaven	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh) 8.37	(\$million)	Surplus
		2565	7,365	2,900	-1,026	-2,869	30.27		-80	
	WERE_4_GEN_Wolfcreek_G	3632	3,510	2,459	-481	-1,564	43.55	12.49		
PJM	VAP_7_G	1371	4,179	303	-974	-1,741	55.16	18.38	-74	
MISO	WEC_3_MSA_Milwaukee_G	7208	1,429	2,423	-320	-1,202	30.99	11.27	-72	
	SMEPA_5_MSA_Laurel_G	8784	341	184	-189	-359	42.69	12.34		116
	EES_4_GEN_Ouachita_G	3427	6,345	2,417	-572	-1,335	33.78	7.17	-66	
	NPPD_7_L	8784	210	975	-354	-707	19.92	8.93		118
	DOE_2_MSA_Paducah_G	8784	520	309	-190	-299	36.27	11.19		
	NPPD_1_MSA_GrandIsland_L	8784	376	983	-415	-793	16.08	8.73		
	PECO_1_MSA_Philadelphia_G	5050	2,323	554	-212	-375	47.12	13.55	-50	
	NEPOOL_3_ME	5032	3,494	2,522	-208	-1,038	44.51	9.54	-47	122
MISO	SUNC_3_MSA_GardenCity_G	7522	840	18	-167	-228	36.71	15.89	-46	
	AMRN_12_MSA_StLouis_L	2082	5,059	6,066	-463	-1,852	45.08	11.86		
MISO	WPS_4_MSA_Marshfield_L	8781	411	442	-160	-288	30.07	13.13		125
	TVA_9_MSA_Paducah_G	4970	4,470	2,130	-174	-709	39.63	12.01	-34	
	BGE_7_MSA_Baltimore-Towson_G	1718	2,548	1,043	-403	-704	46.73	13.42	-32	
	NEPOOL_1_VT	3678	821	1,115	-149	-637	53.92	8.99	-30	
	MGE_7_MSA_Madison_L	7816	399	403	-133	-272	27.13	12.29	-28	
PJM	RECO_1_MSA_NewYork_L	8784	-	146	-57	-137	51.85	13.31	-26	
MAPP	WAPA_2_MSA_RapidCity_G	5528	2,405	813	-252	-389	16.85	8.20	-23	
	AEPW_9_MSA_MountPleasant_G	1800	8,168	3,832	-294	-1,361	39.92	6.61	-21	132
	NEPOOL_7_CT	1117	4,447	3,920	-320	-1,094	58.57	8.82	-21	133
PJM	VAP_26_MSA_DC_G	2973	1,981	631	-155	-434	43.38	13.30		
SPP	OMPA_9_MSA_PoncaCity_G	8084	163	147	-51	-127	47.92	13.49		
MISO	WEPL_7_MSA_DodgeCity_G	8656	137	124	-59	-115	38.65	16.54	-20	136
MISO	CIN_3_MSA_TerreHaute_G	1816	3,230	1,015	-326	-558	31.47	8.84	-19	137
MISO	CWLP_1_MSA_Springfield_G	5512	310	227	-103	-186	28.79	9.08	-16	138
SPP	EMDE_1_MSA_Joplin_G	4549	1,102	458	-106	-376	33.89	9.49	-16	139
SPP	SPS_2_GEN_Tolk1_G	3257	4,480	2,973	-86	-287	55.52	11.74	-16	140
VACAR	CPLE 1 MSA Durham G	1229	10,224	8,563	-310	-1,503	39.64	10.64	-15	141
SPP	LEPA 5 MSA Houma-Bayou G	8784	93	73	-39	-74	41.71	12.16	-14	142
MISO	LES 5 MSA Lincoln G	8561	264	108	-55	-103	27.36	14.39	-13	143
	DUK_5_MSA_Seneca_G	1193	1,911	-	-330	-1,100	31.17	5.04	-12	
	NYISO 4 NYD	1112	1,206	681	-269	-950	41.02	9.83	-12	
	MIDW_7_MSA_Hays_L	8784	19	92	-39	-88	35.59	13.96	-12	
	AEPW_5_MSA_Tulsa_G	1722	4,226	2,571	-181	-898	39.05	9.77	-12	
	DENL 7 MSA LittleRock L	8784	-,5	81	-35	-81	37.87	9.53		

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

			0		A	M. N.		<b>D</b> :		Rank
			Gen	Load	Avg net	Max Net	D :	Price	Revenue	based on
Manhat Anas	Hale Nieuwe	Oirele I Irre	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	UPPC_9_MSA_Houghton_L	8784	2	75	-40	-63	32.97	15.34	-11	149
PJM	PENELEC_2_MSA_DuBois_G	1031	2,724	1,196	-228	-800	46.38	9.29	-11	150
	DERS_1_MSA_Ruston_G	8466	75 2.544	68	-31	-52 -825	39.03	9.75	-10	
	EES_10_MSA_Vicksburg_G	696	3,544	1,249	-351		40.52	10.38	-10	
	NYISO_6_NYF	1006	4,103	1,983	-230	-1,041	41.39	10.66	-10	
	IESO_15_G	388	1,964	3,375	-608	-1,185	36.91	6.09	-9	
	RCU_6_MSA_Orlando_L	8784	-	38	-20	-35	45.82	11.98	-8	
	CWLD_2_MSA_Columbia_L	8784	-	48	-25	-46	34.05	11.41	-7	156
	MEC_3_MSA_DesMoines_G	775	3,307	1,933	-289	-663	30.03	11.54	-7	
SPP	GRDA_2_G	1182	849	179	-166	-429	32.41	6.98	-6	
	SOCO_2_GEN_Hartwll_G	5955	2,186	46	-23	-36	38.73	10.85	-5	
	MIPU_7_MSA_KansasCity_G	3893	1,307	437	-54	-282	23.86	9.29	-5	
FRCC	FPC_10_MSA_Lakeland_G	691	3,561	747	-208	-368	34.31	6.65	-5	
VACAR	CPLW_3_Asheville_G	2582	764	93	-50	-67	38.37	9.38	-5	
SPP	SPRM_10_MSA_Springfield_L	3025	236	346	-40	-172	40.51	11.45	-5	
	ALTW_6_MSA_CedarRapids_L	561	996	1,103	-187	-766	44.94	14.18	-5	
	NYISO_1_NYA	461	4,946	2,500	-295	-1,180	33.45	6.58	-5	
	SOCO_32_MSA_Pascagoula_G	674	3,574	2,674	-177	-704	37.89	10.80	-5	
PJM	PL_8_MSA_Allentown_G	1058	2,853	385	-89	-177	47.94	13.72	-5	
VACAR	SCEG_1_MSA_Columbia_G	412	4,954	2,752	-335	-1,147	32.23	6.08	-4	
FRCC	STK_1_L	8784	-	17	-11	-18	45.77	11.91	-4	
	BCA_1_GEN_NRGBatesville_G	8064	87	14	-15	-23	36.40	8.60	-4	
PJM	OVEC_3_G	6444	1,620	10		-34	35.43	9.13	-4	
	IP_8_GEN_Clinton_G	773	2,302	1,195	-156	-524	30.85	10.14	-4	
	NI_6_MSA_Chicago_G	463	9,759	7,577	-232	-1,050	33.83	13.58	-4	
MISO	SIPC_9_MSA_Marion-Herrin_G	2965	432	37	-29	-53	33.20	9.23	-3	
PJM	UGI_2_MSA_Scranton_G	8784	48	8	-6	-9	49.51	12.70	-3	
SPP	SWPA_2_MSA_MountainHome_G	3526	478	70		-42	28.17	7.40	-2	
	SOCO_28_MSA_Birmingham_G	168	2,535	1,090	-297	-397	44.84	9.42	-2	
	NEPOOL_2_NH	283	4,204	2,621	-179	-774	42.41	4.09	-2	
MISO	CILC_8_MSA_Peoria_G	752	756	349	-110	-213	24.71	8.51	-2	
	NI_20_MSA_Chicago_G	1550	1,632	83	-41	-65	31.82	10.14	-2	
SPP	CELE_10_MSA_Alexandria_G	198	1,895	742	-232	-379	42.08	14.00	-2	
MISO	ALTE_2_MSA_Madison_G	168	1,665	441	-278	-363	27.57	9.10	-1	182
MISO	DPC_10_G	951	615	140	-66	-115	16.20	3.06	-1	183
	SOCO_15_MSA_Birmingham_G	89	12,464	9,217	-192	-605	48.83	7.01	-1	184
TVAUTHOR	TVA_4_MSA_Clarksville_G	168	2,544	150	-98	-137	37.83	10.99	-1	185

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2008R2

Market Area	Hub Name	Sink Hrs	Gen Weight (MW)	Load Weight (MW)	Avg net injection (MW)	Max Net injection (MW)	Price (\$/MWh)	Price Std.Dev (MWh)	Revenue Surplus (\$million)	Rank based on Revenue Surplus
MISO	HE 9 MSA TerreHaute G	288	1,016	27	-36	-54	37.25	9.76	0	
FRCC	FPL_8_MSA_PortStLucie_G	33	10,364	4,623	-314	-613	35.25	8.08	0	187
FRCC	GVL_3_MSA_Gainesville_G	1176	433	15	-7	-14	42.70	9.10	0	188
	FE_9_MSA_Weirton_G	156	1,860	112	-55	-64	35.72	9.41	0	189
MAPP	MPW_1_MSA_Muscatine_G	1479	151	16	-9	-13	21.29	10.54	0	190
PJM	PEPCO_8_MSA_DC_G	53	3,786	1,108	-84	-182	57.16	9.80	0	191
FRCC	OUC_1_MSA_Orlando_G	168	889	73	-34	-46	43.03	7.75	0	192
MISO	SMMPA_9_MSA_Rochester_G	8543	128	58	-1	-20	26.28	11.82	0	193
	LWU_1_MSA_Miami_G	2192	250	82	-2	-3	40.98	15.69	0	194
SPP	WERE_1_MSA_Manhattan_G	45	2,988	409	-143	-202	21.53	9.56	0	195
FRCC	FMP_8_MSA_Sebastian_G	6970	145	20	0	-1	42.77	10.37	0	
PJM	DLCO_7_MSA_Pittsburgh_G	168	1,644	25	-17	-22	42.19	11.37	0	197
	NPPD_4_GEN_Gentleman_G	24	2,702	148	-181	-210	27.05	13.47	0	198
	NSB_1_MSA_DaytonaBeach_G	1461	514	86	-2	-3	39.48	11.33	0	199
	LAK_1_MSA_Lakeland_G	213	819	28	-10	-14	36.49	9.18	0	
FRCC	KEY_1_MSA_KeyWest_G	535	880	138	-3	-5	46.58	10.95	0	
	SOCO_31_MSA_Atlanta_G	12	11,765	1,583	-83	-172	23.19	0.74	0	
MISO	NIPS_8_MSA_Chicago_G	24	2,892	1,694	-37	-97	23.16	3.91	0	203
	INDN_6_MSA_KansasCity_G	210	143	27	-5	-9	18.28	10.46	0	204
	TVA_1_MSA_Chatt-Hunts_G	3	17,334	9,966	-119	-334	28.09	3.47	0	
	DUK_9_MSA_Charlotte_G	1	14,681	9,966	-97	-97	64.50		0	
	CIN_8_MSA_Evansville_G	1	3,657	260	-106	-106	41.93		0	
SOUTHERN	AEC_8_G	1	903	60	0	0	24.98		0	208

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	12.71	-1,782	. 1
	NYISO_10_NYJ	8760	10,283	11,493	-3,436	-5,455	54.91	12.77	-1,653	2
ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	14.71	-1,236	3
FRCC	FPL 7 MSA Miami L	8760	570	3,923	-2,634	-4,256	51.45	14.54	-1,187	4
ONTARIO	IESO_11_G	8760	9,529	12,779	-3,043	-7,371	44.44	10.23	-1,184	5
FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197	-4,333	51.48	14.70	-991	6
NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,912	-2,882	55.40	12.73	-928	7
ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	44.27	10.03	-915	8
FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,012	-3,788	49.76	13.31	-877	9
VACAR	DUK_8_MSA_Charlotte_L	8760	1,407	4,886	-2,234	-3,877	44.01	12.01	-861	10
PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,877	-2,931	51.79	14.59	-852	11
MISO	ITC_9_MSA_Detroit_L	8760	1,340	4,751	-2,179	-4,538	41.85	11.73	-799	12
MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,748	38.45	11.89	-765	13
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,960	-3,169	44.31	12.18	-761	14
SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	44.21	12.10	-756	15
NEPOOL	NEPOOL_4_NEBOS	8727	3,262	5,904	-1,533	-3,500	51.56	10.73	-690	16
FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,542	-2,658	50.34	14.09	-680	17
VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	13.36	-614	18
TVAUTHOR	TVA_7_MSA_Memphis_L	8745	7,215	5,982	-1,707	-4,409	41.06	11.46	-613	19
PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	12.48	-598	20
TVAUTHOR	TVA_5_MSA_Nashville_L	8677	9,154	8,858	-1,638	-5,752	41.29	12.38	-587	21
MISO	LGEE_5_MSA_Lexington_L	8760	595	2,345	-1,786	-2,997	37.32	11.85	-584	22
FRCC	FPL_2_MSA_FortMyers_G	8701	5,929	4,563	-1,280	-2,761	51.01	14.36	-568	23
PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,606	-2,415	40.29	15.27	-567	24
PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,225	-2,112	52.37	14.07	-562	25
PJM	AEP_9_MSA_Canton-Massillon_L	8760	733	2,120	-1,552	-2,252	40.79	11.49	-554	26
PJM	PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,182	-2,500	51.96	13.42	-538	27
	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,372	-2,611	44.19	12.10	-531	28
	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,410	-2,066	42.17	11.19	-521	29
PJM	DPL_3_MSA_Dayton_L	8760	1,350	2,652	-1,453	-2,516	40.31	11.93	-513	30
MISO	FE_4_MSA_Akron_L	8760	531	2,277	-1,282	-1,778	40.86	11.28	-459	31
	TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,315	-2,941	39.50	12.47	-455	32
NEPOOL	NEPOOL_6_WCMA	8554	4,285	3,417	-1,028	-3,107	51.63	10.79	-454	
	IESO_3_L	8760	39	1,696	-1,181	-1,636	43.42	9.29	-449	34
	SOCO_8_MSA_Atlanta_L	8760	-	1,925	-1,139	-1,932	44.21	12.11	-441	35
PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-969	-2,093	51.97	13.41	-441	36
FRCC	TECO_7_MSA_Tampa_L	8760	-	1,481	-975	-2,089	50.29	13.79	-430	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

								<b>.</b>		Rank
			Gen	Load	Avg net	Max Net	ъ.	Price	Revenue	based on
NA - 1 - 1 A	II I Nicos	0:1111	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	JCPL_1_MSA_NewYork_L	8760	-	1,792	-920	-2,073	51.83	13.33	-418	
PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,115	-1,684	42.35	10.85	-414	
PJM	PEPCO_1_MSA_DC_L	8760	- 4.004	1,439	-883	-1,547	52.59	14.81	-407	40
MISO	ITC_2_MSA_Detroit_L	8625	4,001	5,247	-1,114	-3,583	41.97	11.67	-403	
SPP	OKGE_4_MSA_OklahomaCity_L	8742	2,102	2,403	-796	-1,677	55.82	20.73	-389	
	NYISO_9_NYI	8288	2	1,476	-845	-2,165	54.27	11.83	-380	
	BGE_5_MSA_Baltimore-Towson_L	8760	263	1,462	-774	-1,495	52.56	14.09	-356	
MISO	FE_8_MSA_Youngstown_L	8760	939	2,217	-975	-1,607	40.77	11.20	-348	
	NEPOOL_9_NWKST	8760	405	1,524	-731	-1,289	53.08	11.80	-340	
PJM	AEP_3_MSA_Columbus_L	7796	10,204	8,244	-1,103	-3,787	39.47	11.59	-339	
PJM	JCPL_3_MSA_NewYork_L	8760	1,315	2,735	-739	-2,248	52.10	13.56	-337	48
PJM	AP_8_MSA_DC-VA-MD_L	8760	-	1,097	-728	-1,048	51.92	15.29	-331	49
PJM	PL_5_MSA_Lancaster_L	8760	-	897	-721	-1,027	51.75	13.61	-327	50
	NYISO_7_NYG	8164	3,156	2,195	-771	-1,760	51.55	10.89	-324	
	BGE_9_MSA_Baltimore-Towson_L	8760	-	1,186	-690	-1,231	53.00	14.51	-320	
	PL_7_MSA_Allentown_L	8760	245	1,051	-695	-1,038	51.57	13.16	-314	
PJM	AP_7_MSA_Hagerstown-Martinsburg	8760	203	1,153	-686	-1,101	51.50	15.14	-309	
MISO	GRE_4_MSA_Minneapolis_L	8760	331	1,111	-1,099	-2,103	31.83	18.20	-307	55
	SOCO_21_MSA_Atlanta_G	8673	3,334	2,733	-780	-1,570	43.92	11.83	-297	56
	METC_9_MSA_Kalamazoo_L	8760	118	1,334	-812	-1,476	41.72	12.00	-297	57
PJM	VAP_27_MSA_DC_L	8760	-	1,048	-643	-1,075	51.74	14.31	-291	58
MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-884	-1,480	37.57	13.06	-291	59
	SOCO_10_MSA_Albany-Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	11.21	-284	
NYPP	NYISO_2_NYB	8760	650	1,759	-733	-1,245	44.16	9.46	-284	
SOUTHERN	SOCO_6_MSA_Augusta-Richmond_L	8760	-	1,187	-720	-1,220	44.25	11.97	-279	62
PJM	PECO_8_MSA_Philadelphia_L	8760	399	1,064	-606	-1,130	52.16	13.52	-277	63
MISO	IPL_5_MSA_Indianapolis_L	8760	306	1,187	-784	-1,258	38.66	12.07	-266	64
MISO	FE_7_MSA_Toledo_L	8701	2,586	2,106	-676	-1,252	41.13	11.57	-242	65
ENTERGY	EES_3_MSA_Beaumont-PortArthur_L	8760	265	1,099	-614	-1,022	44.20	10.39	-238	66
PJM	PEPCO_4_MSA_DC_L	8760	-	825	-511	-895	52.82	14.68	-236	67
PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-540	-1,124	49.78	12.43	-236	68
SPP	KACP_7_MSA_KansasCity_L	8760	-	1,291	-730	-1,422	36.39	17.73	-233	
MISO	AMRN 2 County Macon L	8760	174	1,209	-720	-1,156	36.57	11.78	-231	70
PJM	BGE 8 MSA Baltimore-Towson L	8760	-	840	-493	-880	52.84	14.44	-228	
	BGE 10 MSA Baltimore-Towson L	8760	845	1,565	-478	-1,030	52.69	14.21	-220	
MISO	XEL_3_MSA_Minneapolis_G	5875	7,596	7,622	-947	-2,499	38.26	16.81	-213	
PJM	PEPCO 5 MSA DC L	8760	- ,556	710		-796	52.86	14.52	-210	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	METC_8_MSA_BayCity_G	8149	3,795	2,562	-600	-1,641	42.36	11.07	-207	75
	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	36.47	12.65	-204	76
	AE_7_MSA_OceanCity_G	8760	90	836	-441	-916	52.46	14.27	-203	77
VACAR	DUK_4_MSA_Greenville_L	7310	3,546	4,489	-613	-2,063	44.21	12.73	-198	
VACAR	CPLE_9_MSA_NewBern_L	8760	53	811	-493	-792	45.78	11.78	-198	
MISO	FE_10_MSA_Mansfield_L	8760	46	859	-536	-842	40.96	11.59	-192	80
MISO	FE_5_MSA_Cleveland_L	8040	3,216	4,680	-570	-2,443	41.75	11.39	-191	81
MISO	LGEE_8_L	8760	33	771	-559	-928	38.20	11.86	-187	82
MISO	IPL_8_MSA_Indianapolis_L	8760	547	1,227	-531	-1,094	38.73	12.19	-180	
VACAR	SCEG_9_MSA_Charleston_G	8669	1,152	1,944	-460	-1,230	44.76	12.24	-179	
	IESO_2_G	6842	2,437	2,116	-618	-1,367	42.07	9.71	-178	
SOUTHERN	SOCO_17_MSA_Mobile_G	7378	5,205	4,575	-559	-1,701	42.60	10.62	-176	
	TVA_10_MSA_Grenada_L	8760	-	651	-479	-809	41.81	11.36	-176	• .
ENTERGY	AECI_3_L	8760	-	915	-503	-932	38.51	13.71	-170	
	NYISO_5_NYE	8756	1,098	909	-392	-776	48.48	11.31	-166	89
SPP	WFEC_7_MSA_Woodward_G	8760	342	193	-346	-590	53.68	18.24	-163	90
MAPP	OPPD_5_MSA_Omaha_L	8760	480	1,686	-854	-1,534	21.57	10.43	-161	91
SPP	AEPW_1_MSA_Tulsa_G	8257	3,295	2,000	-739	-1,383	26.36	16.65	-161	92
SOUTHERN	SOCO_22_MSA_Atlanta_L	8760	41	661	-397	-673	44.34	12.27	-154	93
PJM	PECO_5_MSA_Philadelphia_L	6966	1,656	2,510	-394	-2,388	55.94	11.29	-153	94
PJM	PEPCO_7_MSA_DC_L	8760	-	655	-326	-570	52.89	14.62	-151	95
MISO	WEC_7_MSA_Milwaukee_G	8542	3,850	3,052	-620	-1,688	28.44	14.33	-151	96
PJM	PSEG_6_MSA_NewYork_L	8760	-	639	-329	-680	51.95	13.39	-150	
PJM	DP&L_6_MSA_Seaford_L	8480	1,438	1,523	-330	-972	52.54	13.34	-147	98
PJM	DLCO_1_MSA_Pittsburgh_L	8760	-	635	-420	-667	39.52	11.50	-145	99
MISO	CIN_4_MSA_Cincinnati-Middletown_0	6000	6,026	5,727	-588	-2,107	40.71	12.63	-144	100
NEPOOL	NEPOOL_10_RI	6779	2,062	2,203	-410	-1,213	51.13	11.39	-142	101
ENTERGY	EES_7_MSA_Beaumont-PortArthur_0	6502	7,393	4,949	-497	-1,630	42.86	11.40	-138	102
PJM	VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	24.20	-121	103
ENTERGY	EES_9_MSA_Russellville_G	6000	6,123	4,517	-452	-2,066	44.29	10.44	-120	104
ENTERGY	AECI 9 L	8760	-	694	-380	-704	35.36	10.97	-118	105
MISO	LGEE 9 MSA Louisville G	8355	1,136	1,763	-395	-1,420	35.03	13.20	-116	106
MISO	MP_7_MSA_Duluth_L	8760	514	824	-488	-747	26.19		-112	107
	AECI 7 MSA KansasCity L	8760	-	615	-351	-651	35.80	12.56	-110	
MISO	SIGE_9_MSA_Evansville_L	8760	159	774	-314	-541	38.26	14.08	-105	109
	METED_4_MSA_Reading_G	7450	913	854	-276	-569	50.81	13.81	-105	110
	METC 4 MSA Holland-GrandHaven	2628	7,365	2,900	-1,096	-2,762	32.59	9.88	-94	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
SPP	WERE_5_MSA_KansasCity_L	8760	204	915	-305	-897	35.12	17.17	-94	
MISO	OTP_1_L	8760	-	640	-433	-692	24.51	11.16	-93	113
SPP	WERE_4_GEN_Wolfcreek_G	4485	3,510	2,459	-453	-1,676	45.34	15.90	-92	114
	SMEPA_5_MSA_Laurel_G	8760	341	184	-216	-396	44.73	12.00	-85	
	NPPD_1_MSA_GrandIsland_L	8760	376	983	-430	-837	20.33	14.94	-77	116
	NPPD_7_L	8760	210	975	-372	-751	20.95	9.65	-68	
PJM	PECO_1_MSA_Philadelphia_G	5891	2,323	554	-228	-379	49.56	13.45	-66	118
	NEPOOL_3_ME	5139	3,494	2,522	-247	-1,052	44.96	9.27	-57	119
MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	12.65	-46	
	EES_4_GEN_Ouachita_G	2274	6,345	2,417	-543	-1,404	35.21	7.42	-43	
MISO	WPS_4_MSA_Marshfield_L	8760	411	442	-150	-285	29.82	15.80	-39	122
	NEPOOL_1_VT	3999	821	1,115	-166	-694	54.74	8.63	-36	
NEPOOL	NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	10.12	-35	124
MISO	SUNC_3_MSA_GardenCity_G	5859	840	18	-157	-231	36.69	15.59	-34	125
MISO	MGE_7_MSA_Madison_L	8125	399	403	-130	-272	29.31	12.58	-31	126
MAPP	WAPA_2_MSA_RapidCity_G	5583	2,405	813	-270	-419	18.81	10.00	-28	127
PJM	RECO_1_MSA_NewYork_L	8760	-	146	-60	-144	52.38	13.29	-28	128
VACAR	CPLE_1_MSA_Durham_G	1153	10,224	8,563	-441	-1,529	50.02	9.43	-25	129
PJM	VAP_26_MSA_DC_G	3301	1,981	631	-157	-461	46.16	13.67	-24	130
MISO	CIN_3_MSA_TerreHaute_G	2203	3,230	1,015	-343	-610	31.64	9.19	-24	131
MISO	CWLP_1_MSA_Springfield_G	7461	310	227	-94	-186	33.87	11.71	-24	132
NEPOOL	NEPOOL_8_SWCT	2664	2,678	1,850	-187	-832	46.82	12.19	-23	133
MISO	WEPL_7_MSA_DodgeCity_G	8569	137	124	-60	-117	43.93	18.93	-22	134
SPP	OMPA_9_MSA_PoncaCity_G	7849	163	147	-51	-137	54.21	17.79	-22	135
SPP	EMDE_1_MSA_Joplin_G	5980	1,102	458	-107	-346	33.56	13.76	-22	136
PJM	BGE_7_MSA_Baltimore-Towson_G	944	2,548	1,043	-412	-707	48.45	14.38	-19	137
VACAR	DUK_5_MSA_Seneca_G	1804	1,911	-	-320	-1,100	30.63	6.28	-18	138
SPP	LEPA_5_MSA_Houma-Bayou_G	8759	93	73	-40	-76	45.54	13.31	-16	139
SPP	AEPW_9_MSA_MountPleasant_G	1240	8,168	3,832	-258	-974	46.16	4.48	-15	140
SPP	AEPW_5_MSA_Tulsa_G	1682	4,226	2,571	-203	-904	42.51	13.18	-14	141
MISO	UPPC_9_MSA_Houghton_L	8755	2	75	-41	-64	40.57	30.36	-14	142
NYPP	NYISO_4_NYD	1187	1,206	681	-277	-961	43.16	10.79	-14	143
MISO	WEC_3_MSA_Milwaukee_G	3136	1,429	2,423	-139	-668	30.96	12.13	-13	144
ENTERGY	DENL_7_MSA_LittleRock_L	8760	-	81	-37	-86	40.86	11.45	-13	145
SPP	MIDW_7_MSA_Hays_L	8760	19	92	-40	-92	37.99	16.53	-13	146
MISO	ALTW_6_MSA_CedarRapids_L	1295	996	1,103	-221	-618	44.66	17.00	-13	147
SPP	SPS_2_GEN_Tolk1_G	2316	4,480	2,973	-86	-481	63.95	19.76	-13	148

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

			0					<b>.</b>	-	Rank
			Gen	Load	Avg net	Max Net	ъ.	Price	Revenue	based on
		0: 1 11	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	LES_5_MSA_Lincoln_G	8758	264	108	-58	-109	23.75	10.81	-12	
	NI_6_MSA_Chicago_G	1095	9,759	7,577	-312	-1,427	35.18		-12	
	NYISO_6_NYF	1184	4,103	1,983	-218	-1,044	43.58	11.40	-11	151
	DERS_1_MSA_Ruston_G	8379	75	68	-31	-56	42.52	10.97	-11	152
	EES_10_MSA_Vicksburg_G	696	3,544	1,249	-348	-639	45.59	13.78	-11	153
SPP	SPRM_10_MSA_Springfield_L	4163	236	346	-56	-236	38.50	16.64	-9	
	RCU_6_MSA_Orlando_L	8760	-	38	-20	-36	49.74	13.28	-9	
	CWLD_2_MSA_Columbia_L	8760	-	48	-29	-54	35.28	12.52	-9	
	TVA_9_MSA_Paducah_G	1974	4,470	2,130	-106	-604	42.13		-9	
	SOCO_32_MSA_Pascagoula_G	797	3,574	2,674	-241	-827	39.72	10.63	-8	
	MIPU_7_MSA_KansasCity_G	4379	1,307	437	-67	-380	25.71	10.64	-8	
VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	4.00	-7	
SPP	GRDA_2_G	1241	849	179	-153	-444	34.37	11.66	-7	
	SOCO_2_GEN_Hartwll_G	6034	2,186	46	-26	-42	40.48		-6	
VACAR	SCEG_1_MSA_Columbia_G	581	4,954	2,752	-322	-1,100	34.22	9.15	-6	
	PL_8_MSA_Allentown_G	1583	2,853	385	-74	-215	50.35	12.34	-6	
	IP_8_GEN_Clinton_G	758	2,302	1,195	-193	-619	38.43	9.87	-6	
FRCC	STK_1_L	8760	-	17	-12	-20	50.07	13.37	-5	
	NYISO_1_NYA	450	4,946	2,500	-306	-1,170	36.91	10.66	-5	
SPP	CELE_10_MSA_Alexandria_G	435	1,895	742	-204	-450	53.25	17.43	-5	
PJM	OVEC_3_G	7116	1,620	10	-17	-34	38.06	11.10	-5	169
	BCA_1_GEN_NRGBatesville_G	7702	87	14	-14	-21	37.74	9.61	-4	_
NEPOOL	NEPOOL_2_NH	364	4,204	2,621	-219	-635	44.29	5.40	-4	171
MISO	SIPC_9_MSA_Marion-Herrin_G	3135	432	37	-30	-47	34.19	11.05	-3	
MAPP	NPPD_4_GEN_Gentleman_G	520	2,702	148	-183	-270	32.98	12.81	-3	173
SOUTHERN	SOCO_15_MSA_Birmingham_G	322	12,464	9,217	-195	-875	47.97	7.82	-3	174
PJM	UGI_2_MSA_Scranton_G	8760	48	8	-6	-9	51.11	12.85	-3	175
FRCC	FPC_10_MSA_Lakeland_G	413	3,561	747	-145	-388	41.86	11.99	-3	176
MISO	DPC_10_G	1685	615	140	-74	-124	19.96	7.00	-2	177
SPP	SWPA_2_MSA_MountainHome_G	2925	478	70	-25	-43	28.05	9.37	-2	178
VACAR	CPLW_3_Asheville_G	928	764	93	-52	-74	38.48	10.09	-2	179
TVAUTHOR	DOE 2 MSA Paducah G	8754	520	309	-6	-10	34.74	12.95	-2	
FRCC	KEY_1_MSA_KeyWest_G	8760	880	138	-3	-6	51.38		-2	
	NI 20 MSA Chicago G	886	1,632	83	-43	-69	36.58	11.80	-1	182
MISO	CILC_8_MSA_Peoria_G	340	756	349	-107	-178	25.48	7.21	-1	
	MEC 3 MSA DesMoines G	333	3,307	1,933	-132	-612	20.96	11.53	-1	184
FRCC	FPL_8_MSA_PortStLucie_G	100	10,364	4,623	-217	-1,140	39.43	7.54	-1	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario BaseCase2011R2

			Gen Weight	Load Weight	Avg net injection	Max Net injection	Price	Price Std.Dev	Revenue Surplus	Rank based on Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	FE_6_MSA_Pittsburgh_G	168	2,371	213	-116	-133	· · · · · · · · · · · · · · · · · · ·		-1	186
MISO	WEC_1_MSA_Chicago_G	168	1,728	303	-108	-132	39.76	11.03	-1	187
PJM	PEPCO_8_MSA_DC_G	132	3,786	1,108	-122	-330	44.36	15.33	-1	188
SPP	KACY_10_MSA_KansasCity_G	728	316	40	-24	-24	40.84	20.59	-1	189
PJM	PENELEC_2_MSA_DuBois_G	159	2,724	1,196	-73	-156	50.16	5.10	-1	190
TVAUTHOR	TVA_4_MSA_Clarksville_G	168	2,544	150	-84	-102	38.42	6.55	-1	191
FRCC	GVL_3_MSA_Gainesville_G	1152	433	15	-8	-15	49.08	12.73	0	192
	WERE_1_MSA_Manhattan_G	119	2,988	409	-154	-226	23.11	11.35	0	
	OTP_9_GEN_BigStone_G	120	1,189	136	-85	-128	40.17	13.78	0	
MAPP	MPW_1_MSA_Muscatine_G	1631	151	16	-10	-13	26.14	11.16	0	195
MISO	EEI_2_MSA_Paducah_G	274	507	36	-37	-92	36.60		0	196
	DLCO_7_MSA_Pittsburgh_G	528	1,644	25	-16	-23	41.76	10.66	0	197
	NIPS_8_MSA_Chicago_G	102	2,892	1,694	-110	-375	24.45	7.46	0	
MISO	SMMPA_9_MSA_Rochester_G	8518	128	58	-1	-23	29.59	13.39	0	199
FRCC	OUC_1_MSA_Orlando_G	72	889	73	-49	-62	54.39	14.28	0	
MISO	HE_9_MSA_TerreHaute_G	72	1,016	27	-41	-58	42.91	9.99	0	201
FRCC	FMP_8_MSA_Sebastian_G	6374	145	20	0	-1	44.91	10.21	0	_
FRCC	LWU_1_MSA_Miami_G	1736	250	82	-2	-3	43.35	13.81	0	
	NSB_1_MSA_DaytonaBeach_G	1124	514	86	-2	-3	43.73	14.03	0	
	TVA_1_MSA_Chatt-Hunts_G	5	17,334	9,966	-359	-836	40.62	20.76	0	
ENTERGY	EES_2_MSA_Batesville_G	17	3,525	1,697	-87	-146	41.96	0.93	0	
FRCC	LAK_1_MSA_Lakeland_G	114	819	28	-12	-17	38.47	8.78	0	_
	ITC_3_MSA_Detroit_G	15	3,815	1,600	-40	-91	47.42	4.94	0	
	ALTE_2_MSA_Madison_G	13	1,665	441	-15	-36	10.66	6.37	0	
SPP	INDN_6_MSA_KansasCity_G	26	143	27	-4	-6	13.37	0.98	0	210
				<u> </u>						

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	22.29	-2,441	1
	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,616	-9,590	45.30	20.80	-2,229	2
	EES 5 MSA NewOrleans G	8760	9,735	9,294	-2,966	-5,564	61.64	22.41	-1,601	3
	FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	22.83	-1,549	
	IESO_11_G	8760	9,529	12,779	-3,043	-7,371	56.86	17.73	-1,515	
	NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	22.07	-1,349	
FRCC	FPL 3 MSA Miami L	8760	6,944	7,089	-2,193	-4,333	67.19	22.97	-1,291	7
ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	56.62	17.48	-1,171	8
FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,013	-3,788	64.34	21.01	-1,134	9
PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,875	-2,931	68.74	24.86	-1,129	
	DUK_8_MSA_Charlotte_L	8760	1,407	4,886	-2,150	-3,877	55.28	19.92	-1,041	11
MISO	ITC_9_MSA_Detroit_L	8760	1,340	4,751	-2,178	-4,518	52.48	20.08	-1,001	12
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,970	-3,246	55.44	19.77	-957	13
SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	55.32	19.67	-946	
MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,693	47.39	19.56	-943	15
FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,543	-2,611	65.12	21.61	-880	16
NEPOOL	NEPOOL_4_NEBOS	8715	3,262	5,904	-1,340	-3,500	71.29	18.70	-833	17
TVAUTHOR	TVA_7_MSA_Memphis_L	8753	7,215	5,982	-1,824	-4,409	51.92	18.89	-829	
FRCC	FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	22.40	-755	
PJM	PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,202	-2,535	70.29	23.67	-740	
<b>TVAUTHOR</b>	TVA_5_MSA_Nashville_L	8646	9,154	8,858	-1,614	-5,752	52.89	20.51	-738	
	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	20.57	-737	22
	NEPOOL_6_WCMA	8644	4,285	3,417	-1,170	-3,529	71.38	18.72	-722	23
VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,418	-3,042	57.60	21.01	-716	
MISO	LGEE_5_MSA_Lexington_L	8760	595	2,345	-1,778	-2,923	45.68	19.03	-712	25
PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,611	-2,415	50.19	24.38	-708	
	AEP_9_MSA_Canton-Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	19.49	-694	27
	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,418	-2,066	54.26	18.31	-674	
	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,369	-2,611	55.30	19.65	-663	
PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-1,004	-2,093	70.31	23.66	-618	
PJM	DPL_3_MSA_Dayton_L	8760	1,350	2,652	-1,404	-2,430	50.11	20.06	-616	
PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-961	-2,077	70.95	24.39	-597	32
	TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,298	-2,941	50.62	19.73	-575	
	IESO_3_L	8760	39	1,696	-1,181	-1,636	55.43	16.47	-574	
PJM	JCPL_1_MSA_NewYork_L	8760	-	1,792	-920	-2,073	70.05	23.46	-565	
FRCC	TECO_7_MSA_Tampa_L	8760	-	1,481	-975	-2,089	65.12	21.38	-556	
SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	-	1,925	-1,139	-1,932	55.32	19.68	-552	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	PEPCO_1_MSA_DC_L	8760	-	1,439	-883	-1,547	70.14	25.40	-543	
	NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	20.88	-539	
MISO	FE_4_MSA_Akron_L	8760	531	2,277	-1,214	-1,778	50.24	19.16	-534	
SPP	OKGE_4_MSA_OklahomaCity_L	8737	2,102	2,403	-819	-1,686	73.28	27.24	-525	
MISO	ITC_2_MSA_Detroit_L	8624	4,001	5,247	-1,113	-3,583	52.70	19.95	-506	
	NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	19.92	-503	
PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,039	-1,618	52.94	19.00	-482	44
	NEPOOL_9_NWKST	8760	405	1,524	-736	-1,303	73.99	20.64	-477	45
PJM	JCPL_3_MSA_NewYork_L	8760	1,315	2,735	-719	-2,248	70.54	23.79	-444	
PJM	BGE_5_MSA_Baltimore-Towson_L	8760	263	1,462	-718	-1,436	70.39	24.50	-443	47
PJM	AP_8_MSA_DC-VA-MD_L	8760	-	1,097	-728	-1,048	69.06	26.14	-441	48
PJM	PL_5_MSA_Lancaster_L	8760	-	897	-721	-1,027	69.59	23.52	-439	
PJM	BGE_9_MSA_Baltimore-Towson_L	8760	-	1,186	-690	-1,231	71.02	25.13	-429	
PJM	PL_7_MSA_Allentown_L	8760	245	1,051	-695	-1,038	69.49	23.16	-423	
PJM	AP_7_MSA_Hagerstown-Martinsburg	8760	203	1,153	-686	-1,101	68.30	25.58	-411	52
MISO	FE_8_MSA_Youngstown_L	8760	939	2,217	-904	-1,569	49.85	19.08	-395	
PJM	VAP_27_MSA_DC_L	8760	-	1,048	-643	-1,075	68.61	24.45	-386	
MISO	GRE_4_MSA_Minneapolis_L	8760	331	1,111	-1,099	-2,124	39.95	27.05	-385	
PJM	PECO_8_MSA_Philadelphia_L	8760	399	1,064	-614	-1,130	70.66	23.77	-380	
	METC_9_MSA_Kalamazoo_L	8760	118	1,334	-808	-1,473	52.62	20.53	-372	57
NYPP	NYISO_2_NYB	8760	650	1,759	-731	-1,245	56.33	17.11	-361	58
MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-883	-1,480	46.48	21.35	-360	59
SOUTHERN	SOCO_6_MSA_Augusta-Richmond_L	8760	-	1,187	-720	-1,220	55.53	19.59	-350	60
SOUTHERN	SOCO_21_MSA_Atlanta_G	8716	3,334	2,733	-721	-1,542	55.12	19.44	-346	61
PJM	AEP_3_MSA_Columbus_L	7457	10,204	8,244	-949	-3,468	48.63	19.90	-344	62
PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-590	-1,124	65.06	21.35	-336	63
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	7847	3,431	4,125	-722	-2,957	58.46	18.13	-331	64
MISO	IPL_5_MSA_Indianapolis_L	8760	306	1,187	-784	-1,258	47.74	19.84	-328	65
MISO	FE_7_MSA_Toledo_L	8710	2,586	2,106	-717	-1,342	51.37	19.69	-321	66
PJM	PEPCO_4_MSA_DC_L	8760	-	825	-511	-895	70.62	25.30	-316	67
ENTERGY	EES_3_MSA_Beaumont-PortArthur_L	8760	265	1,099	-615	-992	57.15	17.35	-308	68
PJM	BGE 8 MSA Baltimore-Towson L	8760	-	840	-493	-880	70.74	25.00	-306	
PJM	BGE 10 MSA Baltimore-Towson L	8760	845	1,565	-475	-1,030	70.57	24.65	-294	
SPP	KACP 7 MSA KansasCity L	8760	-	1,291	-730	-1,422	45.88	27.52	-293	
MISO	XEL_3_MSA_Minneapolis_G	5869	7,596	7,622	-992	-2,499	49.87	25.19	-290	
MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	45.09	19.34	-284	
PJM	PEPCO 5 MSA DC L	8760	-	710	-454	-796	70.76	25.10	-282	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

			0		A	NA. N.		<b>D</b> :		Rank
			Gen	Load	Avg net	Max Net	D. 1	Price	Revenue	based on
Manhat Anas	Hale Name	Oire le 1 lere	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AE_7_MSA_OceanCity_G	8760	90	836	-441	-916	71.09	24.59	-275	
	METC_8_MSA_BayCity_G	8173	3,795	2,562	-603	-1,641	53.22	19.33	-262	76
VACAR	CPLE_9_MSA_NewBern_L	8760	53	811	-493	-792	58.42	19.82	-252	77
PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	45.12	20.67	-252	78 70
	FE_10_MSA_Mansfield_L	8760	46	859	-536	-844	50.80	19.64	-238	
	IESO_2_G	6935	2,437	2,116	-635	-1,375	52.91	17.17	-233	
	LGEE_8_L	8760	33	771	-554	-928	47.68	19.20	-231	81
VACAR	DUK_4_MSA_Greenville_L	6832	3,546	4,489	-609	-2,063	54.71	21.32	-228	
	TVA_10_MSA_Grenada_L	8760		651	-479	-809	53.15	18.71	-223	
	IPL_8_MSA_Indianapolis_L	8760	547	1,227	-528	-1,094	47.81	19.94	-221	84
	NYISO_5_NYE	8756	1,098	909	-382	-807	65.65	16.25	-220	85
	AECI_3_L	8760	-	915	-503	-932	48.96	21.93	-216	
SPP	WFEC_7_MSA_Woodward_G	8760	342	193	-348	-590	70.13	24.23	-214	
	EES_7_MSA_Beaumont-PortArthur_0	7005	7,393	4,949	-545	-1,645	55.69	19.12	-213	88
MISO	FE_5_MSA_Cleveland_L	7570	3,216	4,680	-537	-2,443	51.93	19.47	-211	89
SPP	AEPW_1_MSA_Tulsa_G	8026	3,295	2,000	-745	-1,373	35.02	24.33	-209	90
PJM	PSEG_6_MSA_NewYork_L	8760	-	639	-329	-680	70.28	23.57	-203	91
PJM	PEPCO_7_MSA_DC_L	8760	-	655	-326	-570	70.78	25.23	-202	92
VACAR	SCEG_9_MSA_Charleston_G	8571	1,152	1,944	-410	-1,082	56.48	20.01	-199	93
PJM	PECO_5_MSA_Philadelphia_L	6627	1,656	2,510	-372	-2,388	78.95	18.38	-195	
MAPP	OPPD_5_MSA_Omaha_L	8760	480	1,686	-854	-1,549	25.78	16.17	-193	95
	SOCO_22_MSA_Atlanta_L	8760	41	661	-397	-673	55.34	19.74	-193	96
MISO	WEC_7_MSA_Milwaukee_G	8553	3,850	3,052	-631	-1,697	35.10	20.06	-189	
PJM	DLCO_1_MSA_Pittsburgh_L	8760	-	635	-420	-667	47.14	19.48	-174	
PJM	DP&L_6_MSA_Seaford_L	8349	1,438	1,523	-288	-972	71.68	23.61	-172	99
PJM	VAP_7_G	2160	4,179	303	-1,029	-2,509	76.12	40.73	-169	100
SOUTHERN	SOCO_17_MSA_Mobile_G	6866	5,205	4,575	-445	-1,762	54.55	18.21	-167	101
ENTERGY	EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	16.46	-162	102
	METED_4_MSA_Reading_G	7944	913	854	-283	-573	68.42	23.84	-154	103
MISO	CIN_4_MSA_Cincinnati-Middletown_0	5473	6,026	5,727	-560	-2,100	50.20	21.55	-154	104
ENTERGY	AECI_9_L	8760	-	694	-380	-704	44.35	17.98	-148	105
NEPOOL	NEPOOL_10_RI	6427	2,062	2,203	-313	-1,073	70.36	20.31	-142	106
MISO	LGEE_9_MSA_Louisville_G	8306	1,136	1,763	-394	-1,429	42.10	20.48	-138	107
ENTERGY	AECI_7_MSA_KansasCity_L	8760	-	615	-351	-651	44.46	20.05	-137	108
	MP_7_MSA_Duluth_L	8760	514	824	-489	-747	31.16	18.23	-134	
MISO	SIGE_9_MSA_Evansville_L	8760	159	774	-314	-541	47.13	22.59	-130	110
	METC_4_MSA_Holland-GrandHaven	2949	7,365	2,900	-1,065	-2,912	39.84	19.11	-125	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

			0	1	A	NA NI-4		D.:	D	Rank
			Gen	Load	Avg net	Max Net	Duine	Price	Revenue	based on
Markat Araa	Llub Nama	Cink I Iro	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area SPP	Hub Name WERE_4_GEN_Wolfcreek_G	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
		4506	3,510	2,459	-454	-1,676	58.79	25.20	-120	
	WERE_5_MSA_KansasCity_L	8760	204	915	-308	-897	43.89	26.57	-119	
	OTP_1_L	8760	-	640	-433	-692	29.02	15.99	-110	
	SMEPA_5_MSA_Laurel_G	8760	341	184	-223	-416	56.24	18.97	-110	
	PECO_1_MSA_Philadelphia_G	6496	2,323	554	-224	-379	66.59	24.07	-97	116
	NPPD_1_MSA_GrandIsland_L	8760	376	983	-435	-837	21.78	14.58	-83	
	NPPD_7_L	8760	210	975	-374	-751	23.85	13.60	-78	
	NEPOOL_3_ME	4973	3,494	2,522	-232	-1,137	62.13		-72	
	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	20.15	-59	
	EES_4_GEN_Ouachita_G	2241	6,345	2,417	-558	-1,389	42.45	13.74	-53	
	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	17.12	-53	
	NEPOOL_1_VT	3999	821	1,115	-166	-694	75.76	14.02	-50	
MISO	WPS_4_MSA_Marshfield_L	8760	411	442	-150	-264	37.11	23.23	-49	
PJM	VAP_26_MSA_DC_G	4596	1,981	631	-165	-458	59.14	22.83	-45	
	RECO_1_MSA_NewYork_L	8760	-	146	-60	-144	71.62	23.45	-38	
	MGE_7_MSA_Madison_L	7115	399	403	-137	-269	32.71	18.13	-32	
	WAPA_2_MSA_RapidCity_G	5538	2,405	813	-266	-405	20.51	12.79	-30	
	NEPOOL_8_SWCT	2532	2,678	1,850	-187	-736	62.35	22.11	-30	
SPP	OMPA_9_MSA_PoncaCity_G	7791	163	147	-50	-137	74.21	26.64	-29	
MISO	WEPL_7_MSA_DodgeCity_G	8722	137	124	-60	-117	51.11	25.44	-27	131
	SUNC_3_MSA_GardenCity_G	4846	840	18	-152	-231	35.85	16.79	-26	
MISO	CIN_3_MSA_TerreHaute_G	2149	3,230	1,015	-322	-598	36.24	15.23	-25	
	NI_6_MSA_Chicago_G	1489	9,759	7,577	-356	-1,470	45.98	21.69	-24	
MISO	CWLP_1_MSA_Springfield_G	6676	310	227	-90	-181	39.57	19.57	-24	
VACAR	DUK_5_MSA_Seneca_G	2099	1,911	-	-317	-1,100	33.87	11.35	-23	136
VACAR	CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	14.89	-21	137
SPP	LEPA_5_MSA_Houma-Bayou_G	8760	93	73	-40	-76	58.61	20.62	-20	138
SPP	SPS_2_GEN_Tolk1_G	2958	4,480	2,973	-82	-326	80.59	23.50	-20	139
SOUTHERN	SOCO_32_MSA_Pascagoula_G	1287	3,574	2,674	-282	-1,140	52.22	17.46	-19	140
	UPPC_9_MSA_Houghton_L	8757	2	75	-41	-65	52.99	53.48	-19	141
SPP	EMDE 1 MSA Joplin G	4900	1,102	458	-91	-346	40.85	22.85	-18	142
	NYISO 6 NYF	1248	4,103	1,983	-276	-1,071	51.62	20.08	-18	
	NYISO 4 NYD	1145	1,206	681	-275	-932	55.73		-18	
	DENL 7 MSA LittleRock L	8760	-	81	-37	-86	52.15	18.50	-17	145
	ALTW_6_MSA_CedarRapids_L	1251	996	1,103	-227	-618	59.24	25.28	-17	146
	MIDW 7 MSA Hays L	8760	19	92	-40	-92	45.00	23.73	-16	
	EES 10 MSA Vicksburg G	696	3,544	1,249	-365	-639	59.59	21.35	-15	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	LES_5_MSA_Lincoln_G	8743	264	108	-58	-110	28.64	16.98	-15	
	DERS_1_MSA_Ruston_G	8423	75	68	-31	-56	54.84	18.00	-13	
PJM	BGE 7 MSA Baltimore-Towson G	599	2,548	1,043	-355	-702	62.50	27.23	-13	
MISO	WEC 3 MSA Milwaukee G	2647	1,429	2,423	-121	-762	38.91	15.95	-13	152
VACAR	SCEG_1_MSA_rilliwadkee_G	762	4,954	2,752	-363	-1,100	43.09	18.50	-12	
PJM	PL 8 MSA Allentown G	2328	2,853	385	-73	-1,100	69.59	21.03	-12	154
FRCC	RCU_6_MSA_Orlando_L	8760	2,000	38	-20	-36	64.34	20.96	-12	155
SPP	SPRM_10_MSA_Springfield_L	4011	236	346	- <u>-</u> 20	-236	51.21	25.73	-12	156
SPP	AEPW_5_MSA_Tulsa_G	1178	4,226	2,571	-163	-821	58.56	22.44	-11	157
	CWLD 2 MSA Columbia L	8760	7,220	48	-29	-54	43.52	20.01	-11	158
	MIPU 7 MSA KansasCity G	5079	1,307	437	-72	-380	29.77	17.13	-11	159
	TVA 9 MSA Paducah G	1855	4,470	2,130	-101	-502	53.34	23.96	-10	
VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	5.65	-10	
SPP	GRDA_2_G	1138	849	179	-183	-444	43.08	19.07	-9	
	SOCO_2_GEN_Hartwll_G	6034	2,186	46	-26	-42	49.14	19.01	-8	
SPP	CELE_10_MSA_Alexandria_G	467	1,895	742	-222	-450	71.34	31.07	-7	
	IP 8 GEN Clinton G	766	2,302	1,195	-191	-619	48.21	16.30	-7	165
FRCC	STK_1_L	8760		17	-12	-20	64.67	21.19	-7	
PJM	OVEC 3 G	7549	1,620	10	-17	-34	46.98	18.76	-6	
	NYISO 1 NYA	468	4,946	2,500	-302	-1,252	41.99	18.34	-6	
	BCA_1_GEN_NRGBatesville_G	7686	87	14	-14	-21	47.96	16.18	-5	
	AEPW 9 MSA MountPleasant G	356	8,168	3,832	-217	-830	54.90	5.83	-4	
NEPOOL	NEPOOL 2 NH	335	4,204	2,621	-206	-635	58.48	11.79	-4	
PJM	UGI_2_MSA_Scranton_G	8760	48	. 8	-6	-9	68.66	22.60	-4	
FRCC	FPC 10 MSA Lakeland G	440	3,561	747	-141	-385	49.17	19.72	-3	173
MISO	SIPC_9_MSA_Marion-Herrin_G	2575	432	37	-30	-47	38.50	18.03	-3	174
MAPP	NPPD_4_GEN_Gentleman_G	513	2,702	148	-150	-270	38.97	17.47	-3	175
	DPC_10_G	1769	615	140	-76	-124	21.86	10.29	-3	176
SOUTHERN	SOCO_15_MSA_Birmingham_G	253	12,464	9,217	-162	-807	62.12	13.08	-3	177
SPP	SWPA_2_MSA_MountainHome_G	2923	478	70	-25	-43	33.39	15.96	-2	178
TVAUTHOR	DOE_2_MSA_Paducah_G	8751	520	309	-6	-10	44.53	20.36	-2	179
FRCC	KEY_1_MSA_KeyWest_G	8760	880	138	-3	-6	67.08	22.70	-2	180
PJM	NI_20_MSA_Chicago_G	892	1,632	83	-43	-71	44.99	19.97	-2	181
FRCC	FPL_8_MSA_PortStLucie_G	132	10,364	4,623	-244	-996	45.16	13.66	-1	182
MAPP	MEC_3_MSA_DesMoines_G	389	3,307	1,933	-135	-676	26.32	18.16	-1	183
MISO	CILC_8_MSA_Peoria_G	367	756	349	-114	-180	29.80	13.97	-1	184
MISO	WEC_1_MSA_Chicago_G	168	1,728	303	-105	-130	55.83	19.45	-1	185

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario High Case2011R2

Market Area	Hub Name	Sink Hrs	Gen Weight (MW)	Load Weight (MW)	Avg net injection (MW)	Max Net injection (MW)	Price (\$/MWh)	Price Std.Dev (MWh)	Revenue Surplus (\$million)	Rank based on Revenue Surplus
MISO	FE 6 MSA Pittsburgh G	168	2,371	213	-116	-133	· · · · · · · · · · · · · · · · · · ·	16.04	-1	186
SPP	KACY_10_MSA_KansasCity_G	728	316	40	-24		51.94	32.26	-1	187
PJM	PEPCO_8_MSA_DC_G	89	3,786	1,108	-165	-575	55.02	28.14	-1	188
VACAR	CPLW_3_Asheville_G	342	764	93	-50	-74	42.66	18.91	-1	189
TVAUTHOR	TVA_4_MSA_Clarksville_G	168	2,544	150	-84	-102	50.43	12.61	-1	190
FRCC	GVL_3_MSA_Gainesville_G	1128	433	15	-8	-15	63.89	20.26	-1	191
MISO	OTP_9_GEN_BigStone_G	120	1,189	136	-85	-128	51.10	20.69	-1	192
MAPP	MPW_1_MSA_Muscatine_G	1620	151	16	-10	-13	31.32	17.29	0	193
MISO	EEI_2_MSA_Paducah_G	275	507	36	-37	-92	44.53	19.46	0	194
PJM	DLCO_7_MSA_Pittsburgh_G	528	1,644	25	-16	-23	51.55	17.71	0	195
MISO	NIPS_8_MSA_Chicago_G	117	2,892	1,694	-93	-294	25.75	12.16	0	196
MISO	SMMPA_9_MSA_Rochester_G	8534	128	58	-1	-23	36.52	20.51	0	197
FRCC	OUC_1_MSA_Orlando_G	72	889	73	-49	-62	70.21	21.47	0	198
NEPOOL	NEPOOL_5_SEMA	21	6,454	3,978	-145	-522	70.34	20.42	0	199
SPP	WERE_1_MSA_Manhattan_G	76	2,988	409	-134	-196	17.90	11.83	0	200
MISO	HE_9_MSA_TerreHaute_G	72	1,016	27	-41	-58	54.53	17.61	0	201
FRCC	FMP_8_MSA_Sebastian_G	6394	145	20	0	-1	57.36	17.06	0	202
FRCC	LWU_1_MSA_Miami_G	1660	250	82	-2	-3	53.82	22.63	0	203
FRCC	NSB_1_MSA_DaytonaBeach_G	1127	514	86	-2	-3	53.62	23.08	0	204
ENTERGY	EES_2_MSA_Batesville_G	17	3,525	1,697	-87	-146	58.01	1.01	0	205
	TVA_1_MSA_Chatt-Hunts_G	6	17,334	9,966	-314	-836	43.95	29.85	0	_00
FRCC	LAK_1_MSA_Lakeland_G	123	819	28	-12	-17	45.95	16.21	0	
PJM	PENELEC_2_MSA_DuBois_G	15	2,724	1,196	-62	-164	45.10	19.67	0	208
	ITC_3_MSA_Detroit_G	16	3,815	1,600	-37	-91	59.85	13.13	0	209
SPP	INDN_6_MSA_KansasCity_G	26	143	27	-5	-6	13.35	2.16	0	-
MISO	ALTE_2_MSA_Madison_G	11	1,665	441	-16	-34	9.32	8.14	0	211

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,418	-9,590	32.65	9.28	-1,550	
	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	9.79	-1,401	2
ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	11.84	-1,049	3
FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,635	-4,256	44.17	11.26	-1,019	4
ONTARIO	IESO_11_G	8760	9,529	12,779	-3,037	-7,371	38.29	7.36	-1,019	5
FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	11.39	-845	6
VACAR	DUK_8_MSA_Charlotte_L	8760	1,407	4,886	-2,387	-4,010	39.32	9.23	-822	7
NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	9.70	-791	8
ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	38.16	7.20	-789	9
FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,010	-3,708	42.85	9.99	-754	10
PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,858	-2,931	44.34	11.23	-722	11
MISO	ITC_9_MSA_Detroit_L	8760	1,340	4,751	-2,179	-4,527	36.89	8.22	-704	12
MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,268	-3,748	34.52	8.65	-686	
SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	39.20	9.18	-671	14
SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,941	-3,087	39.37	9.30	-669	15
VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	10.67	-590	
FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,541	-2,620	43.37	10.98	-586	
NEPOOL	NEPOOL_4_NEBOS	8717	3,262	5,904	-1,487	-3,459	43.61	8.10	-565	
PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,727	-2,729	36.02	8.88	-545	
MISO	LGEE_5_MSA_Lexington_L	8760	595	2,345	-1,791	-2,997	33.56	8.90	-527	20
<b>TVAUTHOR</b>	TVA_5_MSA_Nashville_L	8689	9,154	8,858	-1,676	-5,752	35.84	8.92	-522	21
PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	10.93	-511	22
PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,281	-2,060	44.73	10.57	-502	23
	TVA_7_MSA_Memphis_L	8714	7,215	5,982	-1,577	-4,469	35.75	8.24	-491	24
	DPL_3_MSA_Dayton_L	8760	1,350	2,652	-1,532	-2,516	35.92	8.47	-482	25
	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,400	-2,611	39.17	9.16	-480	
FRCC	FPL_2_MSA_FortMyers_G	8680	5,929	4,563	-1,236	-2,761	43.91	11.21	-471	27
PJM	AEP_9_MSA_Canton-Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	8.31	-467	28
	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,414	-2,144	36.19	8.42	-448	29
PJM	PSEG_8_MSA_NewYork_G	8758	3,860	3,654	-1,146	-2,500	44.40	9.90	-446	
MISO	FE_4_MSA_Akron_L	8760	531	2,277	-1,321	-1,947	36.78	8.28	-426	
TVAUTHOR	TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,372	-2,941	33.65	9.69	-405	
PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,213	-1,748	37.49	7.78	-398	
	SOCO_8_MSA_Atlanta_L	8760	-	1,925	-1,139	-1,932	39.21	9.19	-391	34
	IESO_3_L	8760	39	1,696	-1,181	-1,636	37.51	6.58	-388	
	NEPOOL_6_WCMA	8556	4,285	3,417	-1,011	-3,114	43.71	8.15	-378	
FRCC	TECO_7_MSA_Tampa_L	8760	-	1,481	-975	-2,089	43.30	10.61	-370	37

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	AEP_3_MSA_Columbus_L	8275	10,204	8,244	-1,221	-3,809	35.73	8.23	-361	38
PJM	JCPL_1_MSA_NewYork_L	8760	-	1,792	-920	-2,073	44.32	9.84	-357	39
MISO	ITC_2_MSA_Detroit_L	8616	4,001	5,247	-1,118	-3,583	36.94	8.21	-356	
PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-908	-2,093	44.40	9.90	-353	
PJM	PEPCO_1_MSA_DC_L	8760	-	1,439	-883	-1,547	45.47	11.54	-352	
MISO	FE_8_MSA_Youngstown_L	8760	939	2,217	-1,066	-1,657	36.66	8.34	-342	43
PJM	BGE_5_MSA_Baltimore-Towson_L	8760	263	1,462	-821	-1,495	45.25	10.70	-325	
NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	45.93	9.07	-322	45
SPP	OKGE_4_MSA_OklahomaCity_L	8719	2,102	2,403	-773	-1,677	45.80	17.80	-309	
	SOCO_21_MSA_Atlanta_G	8631	3,334	2,733	-892	-1,981	38.85	8.88	-299	47
	NYISO_7_NYG	8191	3,156	2,195	-811	-1,818	43.82	7.96	-291	48
PJM	JCPL_3_MSA_NewYork_L	8760	1,315	2,735	-741	-2,248	44.50	10.05	-289	49
NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-729	-1,217	44.85	9.01	-287	50
PJM	AP_8_MSA_DC-VA-MD_L	8760	-	1,097	-728	-1,048	44.81	12.05	-286	
PJM	PL_5_MSA_Lancaster_L	8760	-	897	-721	-1,027	44.34	10.13	-280	52
PJM	BGE_9_MSA_Baltimore-Towson_L	8760	-	1,186	-690	-1,231	45.61	11.08	-276	53
PJM	PL_7_MSA_Allentown_L	8760	245	1,051	-697	-1,038	44.15	9.70	-269	
MISO	GRE_4_MSA_Minneapolis_L	8760	331	1,111	-1,099	-2,103	27.93	14.12	-269	55
PJM	AP_7_MSA_Hagerstown-Martinsburg	8760	203	1,153	-688	-1,101	44.37	11.60	-268	56
MISO	METC 9 MSA Kalamazoo L	8760	118	1,334	-819	-1,476	36.73	8.36	-263	57
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	8.53	-262	58
MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-884	-1,480	33.75	9.35	-261	59
PJM	VAP_27_MSA_DC_L	8760	-	1,048	-643	-1,075	44.35	10.93	-250	60
SOUTHERN	SOCO_6_MSA_Augusta-Richmond_L	8760	-	1,187	-720	-1,220	39.16	9.05	-247	61
	NYISO 2 NYB	8760	650	1,759	-732	-1,245	38.27	6.46	-246	62
MISO	IPL 5 MSA Indianapolis L	8760	306	1,187	-783	-1,258	34.68	8.85	-238	63
PJM	PECO 8 MSA Philadelphia L	8760	399	1,064	-598	-1,130	44.54	10.01	-233	64
SOUTHERN	SOCO_17_MSA_Mobile_G	7920	5,205	4,575	-737	-1,736	37.53	7.84	-219	65
	KACP_7_MSA_KansasCity_L	8760	· -	1,291	-730	-1,422	32.74	12.61	-209	66
MISO	AMRN 2 County Macon L	8760	174	1,209	-720	-1,156	32.79	8.50	-207	67
MISO	FE 5 MSA Cleveland L	8355	3,216	4,680	-655	-2,731	37.30	8.34	-204	68
PJM	PEPCO 4 MSA DC L	8760	-	825	-511	-895	45.57	11.34	-204	
VACAR	SCEG 9 MSA Charleston G	8736	1,152	1,944	-584	-1,451	39.91	9.57	-204	
VACAR	DUK 4 MSA Greenville L	7764	3,546	4,489	-649	-1,947	40.12	9.64	-202	71
	EES 3 MSA Beaumont-PortArthur L	8760	265	1,099	-612	-1,022	37.54	7.77	-201	72
PJM	BGE 8 MSA Baltimore-Towson L	8760		840	-493	-880	45.51	11.05	-197	73
MISO	FE_7_MSA_Toledo_L	8665	2,586	2,106		-1,227	36.09	8.24	-195	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	BGE 10 MSA Baltimore-Towson L	8760	845	1,565	-485	-1,030	45.37	10.83	-193	
PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-499	-1,124	42.94	9.42	-188	76
PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	32.55	9.24	-182	77
PJM	PEPCO 5 MSA DC L	8760	-	710	-454	-796	45.54	11.13	-181	78
MISO	METC_8_MSA_BayCity_G	8013	3,795	2,562	-588	-1,639	37.13	7.43	-175	
VACAR	CPLE_9_MSA_NewBern_L	8760	53	811	-493	-792	40.29	9.12	-174	80
PJM	AE_7_MSA_OceanCity_G	8760	90	836	-441	-916	44.80	10.75	-173	81
MISO	XEL_3_MSA_Minneapolis_G	5811	7,596	7,622	-900	-2,499	33.04	13.33	-173	82
MISO	FE_10_MSA_Mansfield_L	8760	46	859	-536	-843	36.55	8.29	-171	83
MISO	LGEE_8_L	8760	33	771	-561	-928	33.97	8.77	-167	84
MISO	IPL_8_MSA_Indianapolis_L	8760	547	1,227	-539	-1,094	34.73	8.95	-164	85
MISO	CIN_4_MSA_Cincinnati-Middletown_0	6707	6,026	5,727	-643	-2,119	36.70	8.75	-158	86
PJM	DP&L_6_MSA_Seaford_L	8661	1,438	1,523	-409	-997	44.61	9.83	-158	87
TVAUTHOR	TVA_10_MSA_Grenada_L	8760	-	651	-479	-809	36.24	8.25	-152	88
MAPP	OPPD_5_MSA_Omaha_L	8760	480	1,686	-855	-1,549	19.83	7.65	-148	89
ENTERGY	AECI_3_L	8760	-	915	-503	-932	33.66	9.71	-148	90
ONTARIO	IESO_2_G	6738	2,437	2,116	-584	-1,367	36.70	6.96	-144	91
PJM	PECO_5_MSA_Philadelphia_L	7264	1,656	2,510	-413	-2,388	46.84	8.83	-141	92
NYPP	NYISO_5_NYE	8755	1,098	909	-384	-773	41.18	6.68	-138	93
SOUTHERN	SOCO_22_MSA_Atlanta_L	8760	41	661	-397	-673	39.37	9.40	-137	94
PJM	DLCO_1_MSA_Pittsburgh_L	8760	-	635	-420	-667	36.23	8.54	-133	95
SPP	WFEC_7_MSA_Woodward_G	8760	342	193	-344	-584	43.95	15.80	-132	96
PJM	PEPCO_7_MSA_DC_L	8760	-	655	-326	-570	45.57	11.27	-130	
SPP	AEPW_1_MSA_Tulsa_G	8145	3,295	2,000	-707	-1,423	22.54	11.68	-130	98
PJM	PSEG_6_MSA_NewYork_L	8760	-	639	-329	-680	44.39	9.89	-128	99
MISO	WEC_7_MSA_Milwaukee_G	8534	3,850	3,052	-584	-1,628	25.37	11.54	-126	100
NEPOOL	NEPOOL_10_RI	6733	2,062	2,203	-422	-1,198	43.22	8.55	-123	101
MISO	LGEE_9_MSA_Louisville_G	8458	1,136	1,763	-409	-1,420	31.80	10.24	-110	102
	AECI_9_L	8760	-	694	-380	-704	31.18	7.74	-104	103
MISO	MP_7_MSA_Duluth_L	8760	514	824	-485	-747	23.68	9.19	-101	104
ENTERGY	EES_7_MSA_Beaumont-PortArthur_0	6086	7,393	4,949	-446	-1,529	36.79	8.87	-100	105
	AECI_7_MSA_KansasCity_L	8760	-	615	-351	-651	31.94	8.92	-98	106
	EES_9_MSA_Russellville_G	5611	6,123	4,517	-452	-2,048	37.81	8.22	-96	107
MISO	SIGE_9_MSA_Evansville_L	8760	159	774	-314	-541	34.16	10.49	-94	108
MISO	OTP_1_L	8760	-	640	-433	-692	22.31	8.39	-85	109
SPP	WERE_5_MSA_KansasCity_L	8760	204	915	-300	-897	31.82	12.19	-84	110
PJM	METED_4_MSA_Reading_G	6750	913	854	-280	-570	43.38	10.45	-82	111

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		0: 1 11	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
SPP	WERE_4_GEN_Wolfcreek_G	4445	3,510	2,459	-449	-1,676	39.14	10.68	-78	
PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	16.69	-73	
	SMEPA_5_MSA_Laurel_G	8760	341	184	-210	-394	38.97	9.17	-72	
	METC_4_MSA_Holland-GrandHaven_	2271	7,365	2,900	-1,053	-2,678	29.92	5.86	-72	
MAPP	NPPD_1_MSA_GrandIsland_L	8760	376	983	-426	-837	18.89	9.02	-70	
	NPPD_7_L	8760	210	975	-369	-751	19.41	7.27	-63	
	BGE_7_MSA_Baltimore-Towson_G	2487	2,548	1,043	-444	-731	41.86	9.59	-46	
	NEPOOL_3_ME	4928	3,494	2,522	-245	-1,068	37.93	6.54	-46	
PJM	PECO_1_MSA_Philadelphia_G	4654	2,323	554	-222	-375	42.18	9.74	-44	
MISO	SUNC_3_MSA_GardenCity_G	7410	840	18	-149	-231	38.43	15.48	-42	
	EES_4_GEN_Ouachita_G	2453	6,345	2,417	-524	-1,354	30.96	4.87	-40	
MISO	AMRN_12_MSA_StLouis_L	2475	5,059	6,066	-438	-1,792	36.48	9.39	-40	
SPP	EMDE_1_MSA_Joplin_G	7095	1,102	458	-170	-400	30.07	9.32	-36	
MISO	WPS_4_MSA_Marshfield_L	8760	411	442	-152	-263	26.30	12.30	-35	
	NEPOOL_1_VT	3999	821	1,115	-166	-694	46.21	6.72	-31	126
NEPOOL	NEPOOL_7_CT	1734	4,447	3,920	-374	-1,741	46.62	8.25	-30	
	MGE_7_MSA_Madison_L	8698	399	403	-119	-288	27.21	9.96	-28	128
MAPP	WAPA_2_MSA_RapidCity_G	5593	2,405	813	-272	-419	17.76	7.95	-27	129
MISO	CWLP_1_MSA_Springfield_G	8089	310	227	-101	-189	31.21	8.39	-25	130
PJM	RECO_1_MSA_NewYork_L	8760	-	146	-60	-144	44.87	10.04	-24	131
MISO	CIN_3_MSA_TerreHaute_G	2350	3,230	1,015	-330	-620	29.99	6.65	-23	132
VACAR	CPLE_1_MSA_Durham_G	1223	10,224	8,563	-421	-1,661	43.41	7.82	-22	133
MISO	WEPL_7_MSA_DodgeCity_G	8453	137	124	-60	-117	39.28	15.32	-20	134
NEPOOL	NEPOOL_8_SWCT	2451	2,678	1,850	-189	-631	40.65	9.11	-19	135
SPP	OMPA_9_MSA_PoncaCity_G	8224	163	147	-53	-131	41.96	11.81	-18	136
SPP	AEPW_9_MSA_MountPleasant_G	1548	8,168	3,832	-265	-974	39.23	4.88	-16	137
MISO	WEC_3_MSA_Milwaukee_G	3434	1,429	2,423	-148	-918	27.04	10.56	-14	138
SPP	LEPA_5_MSA_Houma-Bayou_G	8760	93	73	-40	-76	39.08	10.78	-14	139
MISO	UPPC_9_MSA_Houghton_L	8753	2	75	-41	-64	35.83	23.55	-13	140
PJM	VAP 26 MSA DC G	2106	1,981	631	-148	-436	39.34	9.18	-12	
NYPP	NYISO 4 NYD	1168	1,206	681	-274	-916	37.69	7.51	-12	
VACAR	DUK 5 MSA Seneca G	1270	1,911	-	-323	-1,100	29.17	4.11	-12	
	MIDW_7_MSA_Hays_L	8760	19	92	-39	-95	34.65	12.60	-12	
	DENL 7 MSA LittleRock L	8760	-	81	-37	-86	35.10	8.42	-11	145
	LES 5 MSA Lincoln G	8760	264	108	-58	-110	21.77	7.77	-11	146
	ALTW 6 MSA CedarRapids L	1365	996	1,103	-212	-618	38.10	13.50	-11	147
SPP	AEPW 5 MSA Tulsa G	1580	4,226	2,571	-170	-655	35.36	10.33	-10	

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
			Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Sink Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	TVA 9 MSA Paducah G	2175	4,470	2,130	-116	-604	37.16	11.32	-9	
	DERS 1 MSA Ruston G	8303	75	68	-31	-56	36.04	8.19	-9	
	EES 10 MSA Vicksburg G	696	3,544	1,249	-336	-639	39.60	10.93	-9	
NYPP	NYISO 6 NYF	1000	4,103	1,983	-232	-1,044	37.45	8.57	-9	
SPP	SPRM_10_MSA_Springfield_L	4476	236	346	-57	-236	33.17	12.07	-8	
PJM	PEPCO 8 MSA DC G	649	3,786	1,108	-312	-692	41.22	8.83	-8	
SPP	SPS 2 GEN Tolk1 G	1736	4,480	2,973	-87	-290	53.96	18.33	-8	155
ENTERGY	CWLD 2 MSA Columbia L	8760	_	48	-29	-54	31.64	8.90	-8	156
FRCC	RCU 6 MSA Orlando L	8760	-	38	-20	-36	42.82	9.97	-8	157
PJM	NI_6_MSA_Chicago_G	772	9,759	7,577	-275	-1,210	31.89	9.71	-7	158
SOUTHERN	SOCO_2_GEN_Hartwll_G	6034	2,186	46	-26	-42	36.73	9.06	-6	159
VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	3.27	-6	160
SPP	GRDA_2_G	1253	849	179	-143	-442	29.68	8.38	-5	161
VACAR	CPLW_3_Asheville_G	2582	764	93	-53	-77	35.99	7.47	-5	162
MISO	IP_8_GEN_Clinton_G	751	2,302	1,195	-194	-619	33.71	6.82	-5	
	MIPU_7_MSA_KansasCity_G	3031	1,307	437	-66	-380	24.26	7.50	-5	164
NYPP	NYISO_1_NYA	462	4,946	2,500	-307	-1,263	33.50	7.13	-5	165
NEPOOL	NEPOOL_2_NH	460	4,204	2,621	-271	-816	37.60	3.55	-5	
FRCC	STK_1_L	8760	-	17	-12	-20	43.19	10.01	-5	167
MISO	SIPC_9_MSA_Marion-Herrin_G	4412	432	37	-31	-51	31.83	7.75	-4	168
SPP	CELE_10_MSA_Alexandria_G	416	1,895	742	-223	-450	42.47	13.62	-4	
	BCA_1_GEN_NRGBatesville_G	7759	87	14	-14	-21	32.56	6.73	-4	170
	SOCO_32_MSA_Pascagoula_G	556	3,574	2,674	-161	-662	35.56	9.05	-3	
PJM	OVEC_3_G	5438	1,620	10	-17	-34	33.05	7.51	-3	
MISO	DPC_10_G	1862	615	140	-75	-123	19.99	6.18	-3	
VACAR	SCEG_1_MSA_Columbia_G	357	4,954	2,752	-248	-1,012	31.39	8.10	-3	
SPP	WERE_1_MSA_Manhattan_G	615	2,988	409	-175	-254	25.13	8.07	-3	
MAPP	NPPD_4_GEN_Gentleman_G	525	2,702	148	-185	-270	27.72	9.19	-3	
PJM	UGI_2_MSA_Scranton_G	8760	48	8	-6	-9		9.43	-2	
PJM	PL_8_MSA_Allentown_G	825	2,853	385	-65	-197	42.96	9.15	-2	
	SOCO_15_MSA_Birmingham_G	207	12,464	9,217	-281	-945	38.21	6.48	-2	
FRCC	FPC_10_MSA_Lakeland_G	336	3,561	747	-148	-399	38.00	8.18	-2	
SPP	SWPA_2_MSA_MountainHome_G	2978	478	70	-25	-41	25.48	6.55	-2	
PJM	PENELEC_2_MSA_DuBois_G	392	2,724	1,196	-101	-388	42.00	5.47	-2	
	DOE_2_MSA_Paducah_G	8754	520	309	-6	-10	29.84	9.94	-2	183
FRCC	KEY_1_MSA_KeyWest_G	8760	880	138	-3	-6	44.11	11.15	-1	184
PJM	NI_20_MSA_Chicago_G	860	1,632	83	-43	-68	32.16	8.01	-1	185

Task 2: Appendix 3, Simulation Results for Sink Hubs by Scenario LowCase2011R2

Market Area	Hub Name	Sink Hrs	Gen Weight (MW)	Load Weight (MW)	Avg net injection (MW)	Max Net injection (MW)	Price (\$/MWh)	Price Std.Dev (MWh)	Revenue Surplus (\$million)	Rank based on Revenue Surplus
MISO	CILC_8_MSA_Peoria_G	342	756	349	-104		24.61	5.70	-1	186
	MEC_3_MSA_DesMoines_G	266	3,307	1,933	-145	-610	18.78		-1	187
	FE_6_MSA_Pittsburgh_G	168	2,371	213	-116	-133	35.12	7.23	-1	188
	WEC_1_MSA_Chicago_G	168	1,728	303	-105	-132	36.47	10.99	-1	189
	KACY_10_MSA_KansasCity_G	728	316	40	-24	-24	36.22	13.51	-1	190
FRCC	FPL_8_MSA_PortStLucie_G	83	10,364	4,623	-173	-962	35.06	4.24	-1	191
	TVA_4_MSA_Clarksville_G	168	2,544	150	-84	-102	32.81	3.87	0	
	MPW_1_MSA_Muscatine_G	1793	151	16	-10	-13	23.62	7.98	0	
	GVL_3_MSA_Gainesville_G	1176	433	15	-8	-15	42.19	9.28	0	
MISO	OTP_9_GEN_BigStone_G	120	1,189	136	-85	-128	33.88	9.81	0	195
	EEI_2_MSA_Paducah_G	274	507	36	-38	-121	31.70	8.39	0	196
PJM	DLCO_7_MSA_Pittsburgh_G	528	1,644	25	-16	-23	37.12	8.14	0	197
MISO	SMMPA_9_MSA_Rochester_G	8518	128	58	-1	-23	26.33	9.97	0	198
FRCC	OUC_1_MSA_Orlando_G	80	889	73	-48	-62	44.87	10.17	0	199
MISO	HE_9_MSA_TerreHaute_G	72	1,016	27	-41	-58	37.60	6.27	0	200
FRCC	FMP_8_MSA_Sebastian_G	6362	145	20	0	-1	38.87	7.07	0	201
FRCC	LWU_1_MSA_Miami_G	1700	250	82	-2	-3	38.49	10.08	0	202
MISO	NIPS_8_MSA_Chicago_G	68	2,892	1,694	-57	-233	24.56	6.59	0	203
FRCC	NSB_1_MSA_DaytonaBeach_G	1120	514	86	-2	-3	39.28	10.23	0	204
ENTERGY	EES_2_MSA_Batesville_G	17	3,525	1,697	-87	-146	34.28	0.29	0	205
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	4	17,334	9,966	-330	-836	36.55	16.93	0	206
FRCC	LAK_1_MSA_Lakeland_G	105	819	28	-11	-17	33.98	5.33	0	207
MISO	FE_9_MSA_Weirton_G	19	1,860	112	-49	-51	38.72	5.65	0	208
MISO	ITC_3_MSA_Detroit_G	16	3,815	1,600	-37	-91	39.29	5.51	0	209
NEPOOL	NEPOOL_5_SEMA	3	6,454	3,978	-68	-77	47.08	0.02	0	210
SPP	INDN_6_MSA_KansasCity_G	60	143	27	-4	-6	24.63	14.84	0	211
MISO	ALTE_2_MSA_Madison_G	14	1,665	441	-13	-34	16.47	1.16	0	212

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016		45.31	16.80		1
	SOCO_26_MSA_Macon_G	8784	6,802	-	5,109		50.67	17.43	,	
	SOCO_31_MSA_Atlanta_G	8775	11,765	1,583	3,912	9,527	50.80	17.52	1,744	
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,409	6,440	57.98			
PJM	PJM500_8_MSA_Philadelphia_G	8784	3,914	-	3,134	3,868	61.77	20.82	1,701	5
	DUK_9_MSA_Charlotte_G	8780	14,681	9,966	3,106	5,530	50.48			6
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	17.09	1,374	7
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26	19.12	1,205	8
PJM	PJM500_7_MSA_York-Hanover_G	8784	2,696	-	2,195	2,570	60.81	20.77	1,172	9
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	17.39	1,144	10
NEPOOL	NEPOOL_5_SEMA	8784	6,454	3,978	1,952	3,703	63.66	15.71	1,092	11
FRCC	TECO_3_MSA_Tampa_G	8784	3,733	1,026	2,075	3,069	58.32	19.39	1,063	12
FRCC	FPL_8_MSA_PortStLucie_G	8763	10,364	4,623	1,943	5,374	58.77	19.82	1,001	13
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	44.36	17.02	975	14
MISO	CIN_8_MSA_Evansville_G	8784	3,657	260	2,476	3,391	43.10	16.97	937	15
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65	13.72	934	16
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	65.27	17.22	906	17
PJM	DPL_8_GEN_Killen_G	8784	2,964	-	2,184	2,940	45.08	16.69	865	18
PJM	PJM500_5_MSA_DC_G	8784	1,730	-	1,516	1,730	61.31	22.59	817	19
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68	15.94	800	20
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	19.38	793	21
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51	17.02	760	22
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96	17.40	742	23
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	44.36	17.02	718	24
FRCC	FPC_2_MSA_HomosassaSprings_G	8784	1,584	-	1,421	1,584	57.25	18.85	714	25
PJM	PJM500_4_MSA_Philadelphia_G	8374	2,383	-	1,338	2,295	61.29	20.38	687	26
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	-	1,475	1,700	52.18	18.27	676	27
PJM	NI_7_MSA_Rochelle_G	8784	2,290	-	2,119	2,290	34.96	20.02	651	28
VACAR	SCPSA_10_MSA_Charleston_G	8616	1,680	-	1,474	1,680	51.19	18.30	650	29
PJM	VAP_7_G	6936	4,179	303	1,656	3,629	56.01	17.02	643	30
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51	15.12	619	31
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	-	1,364	1,700	51.51	17.71	617	32
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,369	1,917	50.59	17.06	597	33
ENTERGY	LAGN_1_MSA_BatonRouge_G	8784	2,199	163	1,343	1,701	49.16	15.40	580	34
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	-	1,232	1,330	56.40	18.63	567	35

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,486	1,894	41.68	18.74		
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	42.60	16.76		
NEPOOL	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82	14.78		38
FRCC	FPC_10_MSA_Lakeland_G	8021	3,561	747	1,087	2,004	59.53	18.55	519	
MISO	ITC_7_MSA_Monroe_G	8712	1,500	-	1,307	1,500	45.01	17.46	513	
PJM	PEPCO_8_MSA_DC_G	8783	3,786	1,108	952	1,918	61.11	22.50	511	41
MISO	ITC_3_MSA_Detroit_G	8784	3,815	1,600	1,266	1,933	45.14	17.53	502	42
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89	17.46	495	43
	NI_15_MSA_Davenport_G	8664	2,479	-	1,717	2,314	33.05	18.79	492	44
MISO	FE_9_MSA_Weirton_G	8571	1,860	112	1,269	1,807	44.07	17.87	480	
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	908	1,345	57.15	19.19	456	46
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,156	1,641	44.39	16.30	451	47
ENTERGY	EES_8_MSA_BatonRouge_G	8520	1,060	-	1,059	1,060	49.06	15.49	443	48
MISO	IP_7_GEN_Baldwin_G	8784	1,900	444	1,189	1,478	41.69	17.58	435	49
SPP	WERE_1_MSA_Manhattan_G	8771	2,988	409	1,354	2,277	36.55	20.40	434	50
VACAR	CPLE_1_MSA_Durham_G	7843	10,224	8,563	1,031	2,817	52.97	19.50	428	51
MISO	METC_4_MSA_Holland-GrandHaven_	5779	7,365	2,900	1,427	4,534	51.55	15.67	425	52
ONTARIO	IESO_15_G	8382	1,964	3,375	1,098	2,054	44.34	17.28	408	53
VACAR	SCEG_1_MSA_Columbia_G	7968	4,954	2,752	946	2,516	52.49	18.15	396	54
VACAR	DUK_5_MSA_Seneca_G	6789	1,911	-	1,003	1,911	54.60	16.95	372	55
MISO	EKPC_8_MSA_Maysville_G	8784	1,396	272	936	1,366	45.18	16.72	372	56
ENTERGY	EES_4_GEN_Ouachita_G	5418	6,345	2,417	1,230	3,507	53.53	13.71	357	57
FRCC	OUC_1_MSA_Orlando_G	8616	889	73	724	867	56.87	18.85	355	58
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	871	1,221	49.71	16.06	350	59
PJM	PENELEC_2_MSA_DuBois_G	8336	2,724	1,196	764	1,643	52.40	16.47	334	60
NEPOOL	NEPOOL_7_CT	7641	4,447	3,920	689	1,728	63.04	16.48	332	61
PJM	NI_6_MSA_Chicago_G	8111	9,759	7,577	1,023	2,890	39.39	19.67	327	62
MISO	HE 9 MSA TerreHaute G	8496	1,016	27	864	999	43.07	16.92	316	63
PJM	BGE 7 MSA Baltimore-Towson G	7994	2,548	1,043	621	1,392	61.96	21.90	308	64
MISO	NIPS_8_MSA_Chicago_G	8765	2,892	1,694	940	1,665	37.31	19.25	307	65
MISO	IP_8_GEN_Clinton_G	8016	2,302	1,195	916	1,230	40.02	18.37	294	66
	BREC_3_County_Webster_G	8784	1,355	476	908	1,163	36.10	15.75	288	67
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,140	33.61	18.79	264	
FRCC	KEY 1 MSA KeyWest G	8244	880	138	507	811	61.43	24.23	257	69
PJM	NI_20_MSA_Chicago_G	7214	1,632	83	889	1,504	39.87	19.79	256	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AEPW_9_MSA_MountPleasant_G	7676	8,168	3,832	715	1,919	46.57	13.68	255	
	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60		240	
	CIN_3_MSA_TerreHaute_G	7034	3,230	1,015	726	2,206	45.20	16.80	231	73
	MEC_3_MSA_DesMoines_G	7991	3,307	1,933	908	1,431	29.65	19.34	215	
	SOCO_2_GEN_Hartwll_G	2829	2,186	46	1,069	1,673	63.70	13.69	193	
SOUTHERN		8782	903	60	431	834	50.71	17.00	192	
	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76	15.13	186	
	ALTE_2_MSA_Madison_G	8616	1,665	441	604	1,083	35.42	19.34	184	
	SOCO_32_MSA_Pascagoula_G	7531	3,574	2,674	469	1,538	50.84	16.79	179	
FRCC	NSB_1_MSA_DaytonaBeach_G	7225	514	86	406	513	59.61	17.95	175	
PJM	PL_8_MSA_Allentown_G	6898	2,853	385	409	2,259	61.07	20.34	173	
FRCC	LAK_1_MSA_Lakeland_G	8594	819	28	345	536	58.06	18.74	172	
SPP	CELE_10_MSA_Alexandria_G	8554	1,895	742	341	961	53.12	23.04	155	83
	NYISO_4_NYD	7581	1,206	681	661	917	30.68	27.59	154	
SPP	AEPW_5_MSA_Tulsa_G	7426	4,226	2,571	406	1,330	47.19	14.31	142	85
SPP	KACP_4_MSA_KansasCity_G	7656	670	-	617	670	29.85	20.91	141	86
MISO	OTP_9_GEN_BigStone_G	8784	1,189	136	738	1,097	20.83	10.09	135	
PJM	PECO_1_MSA_Philadelphia_G	2241	2,323	554	690	1,090	73.18	16.14	113	
SPP	GRDA_2_G	7739	849	179	309	676	46.28	14.91	111	89
MISO	CILC_8_MSA_Peoria_G	8013	756	349	333	594	40.04	19.92	107	90
MISO	EEI_2_MSA_Paducah_G	8784	507	36	279	472	43.56	17.77	107	91
VACAR	CPLW_3_Asheville_G	7812	764	93	245	635	50.89	17.67	97	92
FRCC	GVL_3_MSA_Gainesville_G	7656	433	15	211	300	57.34	19.11	93	93
MISO	DPC_10_G	7770	615	140	322	513	34.51	20.62	86	94
FRCC	LWU 1 MSA Miami G	6592	250	82	196	249	65.70	22.76	85	95
FRCC	TAL 3 MSA Tallahassee G	8091	336	-	184	262	56.29	18.42	84	
MAPP	NPPD_4_GEN_Gentleman_G	8760	2,702	148	635	1,479	13.97	12.44	78	97
FRCC	KIS_10_MSA_Orlando_G	5214	410	-	211	290	66.50	15.48	73	98
	NEPOOL 3 ME	3923	3,494	2,522	293	1,276	61.48	13.41	71	99
MISO	XEL_3_MSA_Minneapolis_G	4112	7,596	7,622	820	2,043	19.05	8.96	64	
PJM	VAP 26 MSA DC G	3928	1,981	631	231	456	69.86	18.63	63	
SPP	SWPA_2_MSA_MountainHome_G	5411	478	70	343	450	32.57	26.12	60	
	MIPU_7_MSA_KansasCity_G	3823	1,307	437	291	672	52.50	19.39	58	
	OVEC 3 G	997	1,620	10	849	1,089	63.98	12.59	54	
	KACY_10_MSA_KansasCity_G	8784	316	40	148	189	41.72	22.34	54	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	ALTW_6_MSA_CedarRapids_L	8228	996	1,103	197	427	32.29	17.01	52	106
MAPP	WAPA_2_MSA_RapidCity_G	3295	2,405	813	586	822	23.51	11.70	45	107
NEPOOL	NEPOOL_10_RI	2214	2,062	2,203	305	988	66.94	10.45	45	
SPP	EMDE_1_MSA_Joplin_G	5895	1,102	458	157	590	47.57	15.82	44	
MISO	SIPC_9_MSA_Marion-Herrin_G	6469	432	37	145	382	45.36	17.85	43	110
NEPOOL	NEPOOL_8_SWCT	2849	2,678	1,850	190	815	70.83	13.94	38	
	EES_7_MSA_Beaumont-PortArthur_G	2045	7,393	4,949	322	1,100	58.00	10.13	38	
SPP	SPS_2_GEN_Tolk1_G	4377	4,480	2,973	102	517	79.43	12.54	35	
NEPOOL	NEPOOL_1_VT	5105	821	1,115	110	391	58.95	15.72	33	114
MAPP	MPW_1_MSA_Muscatine_G	7339	151	16	125	143	34.88	18.80	32	
SPP	WERE_4_GEN_Wolfcreek_G	5131	3,510	2,459	252	755	23.12	24.51	30	116
NYPP	NYISO_7_NYG	805	3,156	2,195	430	1,219	80.74	10.22	28	117
MISO	CIN_4_MSA_Cincinnati-Middletown_G	1819	6,026	5,727	312	1,118	49.17	13.95	28	118
TVAUTHOR	TVA_9_MSA_Paducah_G	3834	4,470	2,130	147	766	48.25	18.36	27	119
SOUTHERN	SOCO_17_MSA_Mobile_G	2075	5,205	4,575	217	995	54.06	17.87	24	120
VACAR	DUK_4_MSA_Greenville_L	1968	3,546	4,489	225	952	50.43	14.65	22	121
SPP	LAFA_7_MSA_Lafayette_G	2840	175	-	92	175	83.27	44.61	22	122
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85	17.35	21	123
PJM	AEP_3_MSA_Columbus_L	1012	10,204	8,244	326	1,601	57.45	14.32	19	124
SPP	AEPW_1_MSA_Tulsa_G	1350	3,295	2,000	237	991	55.66	14.55	18	125
MISO	CWLP_1_MSA_Springfield_G	3931	310	227	85	168	53.08	18.48	18	126
MISO	FE_5_MSA_Cleveland_L	2311	3,216	4,680	199	708	36.68	14.05	17	127
SPP	INDN_6_MSA_KansasCity_G	8604	143	27	45	125	40.77	20.99	16	128
MISO	SUNC_3_MSA_GardenCity_G	2161	840	18	113	198	61.55	13.89	15	129
SPP	SPRM_10_MSA_Springfield_L	5854	236	346	55	159	40.92	15.90	13	130
PJM	METED_4_MSA_Reading_G	1213	913	854	117	373	75.62	16.43	11	131
PJM	PECO_5_MSA_Philadelphia_L	2131	1,656	2,510	116	341	38.73	13.38	10	132
FRCC	FMP_8_MSA_Sebastian_G	1819	145	20	37	65	92.64	18.88	6	133
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	1265	3,431	4,125	146	465	30.93	9.97	6	134
MISO	WEC_7_MSA_Milwaukee_G	715	3,850	3,052	164	858	44.56	26.85	5	135
MISO	MGE_7_MSA_Madison_L	1673	399	403	55	163	54.99	14.74	5	
FRCC	FPL_2_MSA_FortMyers_G	278	5,929	4,563	213	902	69.39	8.54	4	137
MISO	METC_8_MSA_BayCity_G	458	3,795	2,562	136	581	57.30	25.85	4	138
NEPOOL	NEPOOL_6_WCMA	141	4,285	3,417	302	1,015	81.49	6.41	3	139
MISO	WEC_3_MSA_Milwaukee_G	1886	1,429	2,423	70	254	21.23	10.23	3	140

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2008R2

		Source	Gen Weight	Load Weight	Avg net injection	Max Net injection	Price	Price Std.Dev	Revenue Surplus	Rank based on Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	FTP_7_MSA_PortStLucie_G	640	93	-	36	37	115.43	18.91	3	141
	BCA_1_GEN_NRGBatesville_G	746	87	14	50		69.71	11.62	3	142
	LES_5_MSA_Lincoln_G	321	264	108	88	193	87.39	7.73	2	_
TVAUTHOR	TVA_5_MSA_Nashville_L	243	9,154	8,858	215	863	43.33	11.94	2	144
SPP	OMPA_9_MSA_PoncaCity_G	905	163	147	19		102.92	20.64	2	
	IESO_2_G	73	2,437	2,116	283	995	60.35	5.14	1	146
MISO	SMMPA_9_MSA_Rochester_G	168	128	58	71	83	85.68	9.11	1	147
NEPOOL	NEPOOL_4_NEBOS	93	3,262	5,904	180	769	57.20	3.88	1	148
PJM	DP&L_6_MSA_Seaford_L	377	1,438	1,523	39	186	51.94	15.40	1	149
VACAR	SCEG_9_MSA_Charleston_G	290	1,152	1,944	48	194	45.86		1	150
	DERS_1_MSA_Ruston_G	277	75		21	35	87.02	13.34	1	151
MISO	ITC_2_MSA_Detroit_L	243	4,001	5,247	75	276	24.43	5.02	0	
	SOCO_21_MSA_Atlanta_G	19	3,334	2,733	119	630	77.37	12.26	0	
	FE_7_MSA_Toledo_L	6	2,586	2,106	290	376	88.01	2.02	0	154
NYPP	NYISO_5_NYE	27	1,098	909	52	200	64.45	3.81	0	155
TVAUTHOR		11	7,215	5,982	58	159	38.17	19.41	0	
MISO	WEPL_7_MSA_DodgeCity_G	9	137	124	23	41	82.74	2.40	0	157
MISO	WPS_4_MSA_Marshfield_L	10	411	442	16	38	78.06	3.48	0	
SPP	OKGE_4_MSA_OklahomaCity_L	1	2,102	2,403	24	24	86.71		0	159
NYPP	NYISO_9_NYI	317	2	1,476	0	2	37.61	10.80	0	
SPP	WERE_5_MSA_KansasCity_L	1	204	915	12	12	19.10		0	161

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2008R2

		0	Gen	Load	Avg net	Max Net	Б.	Price	Revenue	Rank based on
Naminat Aman	Llub Nama	Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	19.87	2,530	
	SOCO_26_MSA_Macon_G	8784	6,802	-	5,109	6,381	54.56	20.57	2,449	
	PJM500_8_MSA_Philadelphia_G	8784	3,914	-	3,138	3,868	68.73	26.07	1,894	3
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,427	6,440	62.90	23.43	1,893	
	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	20.63	1,885	
	DUK_9_MSA_Charlotte_G	8780	14,681	9,966	3,113	5,523	54.32	20.97	1,485	6
	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	20.21	1,482	7
	PJM500_7_MSA_York-Hanover_G	8784	2,696	-	2,196	2,570	67.12	25.79	1,295	8
	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,495	4,144	42.11	21.42	1,293	9
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,528	3,886	55.06	21.13	1,222	10
FRCC	TECO_3_MSA_Tampa_G	8784	3,733	1,026	2,074	3,032	63.66	22.94	1,160	
	FPL_8_MSA_PortStLucie_G	8747	10,364	4,623	1,944	5,374	64.08	23.20	1,089	12
	NEPOOL_5_SEMA	8784	6,454	3,978	1,703	3,589	72.03	20.20	1,078	
	NYISO_8_NYH	8784	2,021	973	1,581	1,945	77.04	23.77	1,070	
	NYISO_3_NYC	8784	6,711	2,657	1,860	2,732	65.41	17.48	1,069	15
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	47.25	20.05	1,039	16
	CIN_8_MSA_Evansville_G	8783	3,657	260	2,479	3,391	46.16	20.09	1,005	
PJM	DPL_8_GEN_Killen_G	8784	2,964	-	2,193	2,940	48.23	19.78	929	18
PJM	PJM500_5_MSA_DC_G	8784	1,730	-	1,516	1,730	67.14	27.30	894	19
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,949	2,769	50.33	18.82	861	20
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	47.01	22.70	849	21
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37	19.59	783	22
FRCC	FPC_2_MSA_HomosassaSprings_G	8784	1,584	-	1,421	1,584	62.19	21.99	776	23
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	47.25	20.05	765	
PJM	PJM500 4 MSA Philadelphia G	8397	2,383	-	1,320	2,295	68.14	25.50	755	25
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	12,464	9,217	1,611	4,984	54.34	20.09	755	26
	PJM500_9_MSA_Pittsburgh_G	8784	1,700	_	1,474	1,700	56.21	22.30	728	
PJM	VAP 7 G	6905	4,179	303	1,668	3,629	61.02	20.45	703	28
	NI 7 MSA Rochelle G	8784	2,290	-	2,119	2,290	37.75	22.84	703	29
	SCPSA_10_MSA_Charleston_G	8616	1,680	-	1,473	1,680	55.09	21.42	699	
	NYISO 1 NYA	8272	4,946	2,500	1,598	2,466	50.73	18.43	671	31
	PJM500 3 MSA Pittsburgh G	8784	1,705	-	1,358	1,700	55.44	21.61	661	32
_	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,398	1,917	54.53	20.19	657	33
	NEPOOL 2 NH	8519	4,204	2,621	1,085	1,925	68.93	18.55	637	34
	LAGN_1_MSA_BatonRouge_G	8784	2,199	163	1,343	1,701	53.52	18.44	631	35

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2008R2

									_	Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	-	1,231	1,330	61.35	21.92		
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,487	1,898				
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	45.61	19.83		
FRCC	FPC_10_MSA_Lakeland_G	8028	3,561	747	1,085	2,055	64.87	21.70		39
PJM	PEPCO_8_MSA_DC_G	8783	3,786	1,108	957	1,918	66.87	27.13		40
	ITC_7_MSA_Monroe_G	8712	1,500	-	1,307	1,500	48.10	20.59		41
MISO	ITC_3_MSA_Detroit_G	8784	3,815	1,600	1,266	1,970	48.24	20.70		
PJM	NI_15_MSA_Davenport_G	8664	2,479	-	1,716	,	35.62	21.57	530	
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	46.28	19.61	522	44
MISO	FE_9_MSA_Weirton_G	8610	1,860	112	1,265	1,807	46.43	20.02		
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	908	1,349	62.05	22.44		46
	AECI_4_GEN_NewMadrid1_G	8781	2,315	248	1,151	1,615	47.88	19.18		47
ENTERGY	EES_8_MSA_BatonRouge_G	8520	1,060	-	1,059	1,060	53.42	18.56	482	48
VACAR	CPLE_1_MSA_Durham_G	7851	10,224	8,563	1,043	2,644	57.38	21.17	470	49
MISO	IP_7_GEN_Baldwin_G	8784	1,900	444	1,189	1,478	44.83	20.61	468	50
SPP	WERE_1_MSA_Manhattan_G	8753	2,988	409	1,357	2,215	39.31	23.64	467	51
MISO	METC_4_MSA_Holland-GrandHaven_	5726	7,365	2,900	1,396	4,534	55.70	18.85	445	
ONTARIO	IESO_15_G	8385	1,964	3,375	1,097	2,054	47.28	20.34	435	53
VACAR	SCEG_1_MSA_Columbia_G	7951	4,954	2,752	918	2,554	56.51	21.22	413	54
VACAR	DUK_5_MSA_Seneca_G	6783	1,911	-	1,009	1,911	59.37	19.87	406	55
NEPOOL	NEPOOL_7_CT	7678	4,447	3,920	726	1,796	71.28	21.14	397	56
MISO	EKPC_8_MSA_Maysville_G	8784	1,396	272	936	1,366	48.33	19.81	397	57
PJM	PENELEC_2_MSA_DuBois_G	8404	2,724	1,196	821	1,658	56.52	19.86	390	58
FRCC	OUC_1_MSA_Orlando_G	8616	889	73	724	867	61.85	22.01	386	59
ENTERGY	EES_4_GEN_Ouachita_G	5475	6,345	2,417	1,195	3,528	58.13	16.21	380	60
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	867	1,221	53.84	18.99	377	61
PJM	BGE_7_MSA_Baltimore-Towson_G	8212	2,548	1,043	623	1,324	67.80	26.54	347	62
MISO	HE 9 MSA TerreHaute G	8496	1,016	27	864	999	46.17	20.08	339	63
PJM	NI 6 MSA Chicago G	8068	9,759	7,577	994	2,629	42.22	21.69	339	64
MISO	NIPS_8_MSA_Chicago_G	8764	2,892	1,694	943	1,665	40.11	22.06	331	65
SPP	AEPW 9 MSA MountPleasant G	7978	8,168	3,832	800	1,815	50.17	15.47	320	66
MISO	IP 8 GEN Clinton G	8015	2,302	1,195	913	1,230		20.47		
	NYISO 6 NYF	7530	4,103	1,983	569	1,525		17.42		68
MISO	BREC 3 County Webster G	8784	1,355	476	906	1,164	37.08	17.55		69
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,134	35.99	21.58		

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2008R2

			Gen	Lood	Avanot	Max Net		Price	Payanua	Rank based on
		Course		Load Weight	Avg net injection	injection	Price	Std.Dev	Revenue Surplus	Revenue
Market Area	Hub Name	Source Hrs	Weight (MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	KEY 1 MSA KeyWest G	8247	(10100)	138	508	(IVIVV) 811	(\$/\v\\\\) 67.17	28.12	( '	
PJM	NI_20_MSA_Chicago_G	7224	1,632	83	890	1,513	42.90		281 276	71 72
			,							
MISO MAPP	CIN_3_MSA_TerreHaute_G	7044	3,230	1,015	716 904	2,206	48.62	19.93		
	MEC_3_MSA_DesMoines_G	7974	3,307	1,933		1,380	31.70	22.16 15.94		74 75
	SOCO_2_GEN_Hartwll_G	2829	2,186	46	1,069	1,864	69.69			
SOUTHERN		8781	903	60	430	839	54.91	20.12	207	76
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	606	1,085	38.13	21.62	199	
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14	17.72		
FRCC	NSB_1_MSA_DaytonaBeach_G	7199	514	86	406	513	65.16	20.90		
FRCC	LAK_1_MSA_Lakeland_G	8594	819	28	345	608	63.25	21.98		
	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17	20.06		
PJM	PL_8_MSA_Allentown_G	6728	2,853	385	390	2,261	67.64	25.41	177	82
	NYISO_4_NYD	7662	1,206	681	667	908	34.23	31.62	175	
SPP	CELE_10_MSA_Alexandria_G	8563	1,895	742	344	945	58.01	26.68		84
	AEPW_5_MSA_Tulsa_G	7478	4,226	2,571	420	1,245	51.57	16.97	162	85
SPP	KACP_4_MSA_KansasCity_G	7656	670	-	611	670	31.67	24.17	148	
	OTP_9_GEN_BigStone_G	8784	1,189	136	737	1,094	21.48	11.15		
	GRDA_2_G	7701	849	179	311	676	50.68	17.51	121	88
PJM	PECO_1_MSA_Philadelphia_G	2064	2,323	554	688	1,090	83.33	19.03		
MISO	CILC_8_MSA_Peoria_G	8036	756	349	336	594	42.89	21.02		
MISO	EEI_2_MSA_Paducah_G	8784	507	36	279	472	46.87	20.84		
	NEPOOL_3_ME	4348	3,494	2,522	361	1,212	67.94	16.34		92
VACAR	CPLW_3_Asheville_G	7969	764	93	243	635	54.82	20.70	106	
FRCC	GVL_3_MSA_Gainesville_G	7656	433	15	212	374	62.35	22.38	101	94
FRCC	LWU_1_MSA_Miami_G	6633	250	82	196	249	72.07	26.40	94	95
MISO	DPC_10_G	7791	615	140	324	513	37.09	23.59	94	96
FRCC	TAL_3_MSA_Tallahassee_G	8084	336	-	184	262	61.14	21.69	91	97
FRCC	KIS 10 MSA Orlando G	5256	410	-	211	290	72.87	18.23	81	98
MAPP	NPPD 4 GEN Gentleman G	8760	2,702	148	635	1,481	14.17	12.89	79	99
MISO	XEL_3_MSA_Minneapolis_G	4106	7,596	7,622	822	1,981	19.22	9.60	65	100
SPP	SWPA 2 MSA MountainHome G	5478	478	70	338	450	35.01	29.11	65	
PJM	VAP_26_MSA_DC_G	3535	1,981	631	227	456	79.11	21.83	63	102
NEPOOL	NEPOOL 10 RI	2673	2,062	2,203	291	988	76.61	13.88		103
MISO	MIPU_7_MSA_KansasCity_G	3685	1,307	437	272	672	58.31	22.58		
SPP	KACY 10 MSA KansasCity G	8784	316	40	147	189	45.03	25.89		

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2008R2

			Can	Lood	Avanat	May Not		Drice	Dayanya	Rank
		0	Gen	Load	Avg net	Max Net	Duine	Price	Revenue	based on
Montrot Anno	Hub Name	Source	Weight	Weight	injection	injection	Price (\$/MWh)	Std.Dev	Surplus (\$million)	Revenue
Market Area MISO	ALTW 6 MSA CedarRapids L	Hrs	(MW) 996	(MW)	(MW) 197	(MW) 422	( ' /	(MWh)	( ' /	Surplus
	OVEC_3_G	8230 786	1,620	1,103 10	861	1,336	34.46 73.35	19.45 15.14		
SPP			,	458		,				_
	EMDE_1_MSA_Joplin_G	6104	1,102		157	649	51.84	18.79		
	NEPOOL_8_SWCT	3029	2,678	1,850	199	713	81.84	17.52		
MAPP	WAPA_2_MSA_RapidCity_G	3323	2,405	813	582	823	24.58	12.91	48	_
	EES_7_MSA_Beaumont-PortArthur_G	1779	7,393	4,949	321	1,330	64.25	11.66		111
	NEPOOL_1_VT	5105	821	1,115	110	391	65.25	19.94		112
	SPS_2_GEN_Tolk1_G	4162	4,480	2,973	96	517	88.73	14.83		
MAPP	MPW_1_MSA_Muscatine_G	7329	151	16	126	143	37.88	21.69		
MISO	CIN_4_MSA_Cincinnati-Middletown_G	1910	6,026	5,727	325	1,118	53.47	16.40		
SPP	WERE_4_GEN_Wolfcreek_G	5114	3,510	2,459	252	755	23.44	27.17	30	
	TVA_9_MSA_Paducah_G	3821	4,470	2,130	150	826	52.56	21.88		
VACAR	DUK_4_MSA_Greenville_L	2034	3,546	4,489	230	952	55.07	17.40		
SOUTHERN	SOCO_17_MSA_Mobile_G	2046	5,205	4,575	214	1,180	58.33	21.14	26	119
SPP	LAFA_7_MSA_Lafayette_G	2868	175	-	92	175	91.67	47.63	24	120
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91	20.25	23	121
PJM	AEP_3_MSA_Columbus_L	1074	10,204	8,244	322	1,601	62.21	17.10	22	122
MISO	CWLP_1_MSA_Springfield_G	4025	310	227	87	168	57.95	16.57	20	123
SPP	AEPW_1_MSA_Tulsa_G	1344	3,295	2,000	236	996	63.46	15.78	20	124
MISO	FE_5_MSA_Cleveland_L	2526	3,216	4,680	205	734	38.32	16.14	20	125
MISO	SUNC_3_MSA_GardenCity_G	2351	840	18	121	198	63.57	15.18	18	126
SPP	INDN_6_MSA_KansasCity_G	8585	143	27	46	126	44.05	24.38	18	127
NYPP	NYISO_7_NYG	396	3,156	2,195	433	1,063	100.39	12.04	17	128
SPP	SPRM_10_MSA_Springfield_L	5857	236	346	55	159	43.90	18.53	14	129
PJM	PECO 5 MSA Philadelphia L	2189	1,656	2,510	115	343	40.34	16.95	10	130
PJM	METED_4_MSA_Reading_G	1034	913	854	109	275	87.15	19.25	10	131
	FMP_8_MSA_Sebastian_G	1836	145	20	37	85	103.88	21.16	7	132
	SOCO_10_MSA_Albany-Valdosta_L	1313	3,431	4,125	146	465	31.83	11.76	6	133
MISO	WEC 7 MSA Milwaukee G	687	3,850	3,052	162	685	48.70	31.16		
MISO	MGE 7 MSA Madison L	1469	399	403	54	163	61.01	8.36	5	135
FRCC	FPL 2 MSA FortMyers G	271	5,929	4,563	214	902	74.33	9.58		
MISO	METC 8 MSA BayCity G	427	3,795	2,562	142	719	63.78	30.62	4	
MISO	LES 5 MSA Lincoln G	403	264	108	96	205	99.54	8.53	4	
	FTP 7 MSA PortStLucie G	819	93	-	36		122.07	22.62	4	
	BCA 1 GEN NRGBatesville G	763	87	14	50		78.37	13.20		

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	WEC_3_MSA_Milwaukee_G	1903	1,429	2,423		260		11.94	3	
	TVA_5_MSA_Nashville_L	253	9,154	8,858	206	863	47.44	15.05	2	142
	OMPA_9_MSA_PoncaCity_G	835	163	147	20	100	114.82	21.63	2	143
NEPOOL	NEPOOL_4_NEBOS	128	3,262	5,904	173	829	63.75	3.86	1	144
ONTARIO	IESO_2_G	69	2,437	2,116	251	895	66.61	5.26	1	145
	IESO_2_G	69	2,437	2,116	251	895	66.61	5.26	1	146
	SMMPA_9_MSA_Rochester_G	166	128	58	71	83	96.60	10.11	1	147
	DP&L_6_MSA_Seaford_L	404	1,438	1,523	39	186	56.68	18.44	1	148
	SCEG_9_MSA_Charleston_G	345	1,152	1,944	49	182	48.46	15.29	1	149
	DERS_1_MSA_Ruston_G	285	75	68	22	41	100.36	18.63	1	150
	ITC_2_MSA_Detroit_L	244	4,001	5,247	77	276	24.27	5.08	0	101
	NEPOOL_6_WCMA	22	4,285	3,417	169	556	83.15	14.76	0	
	SOCO_21_MSA_Atlanta_G	16	3,334	2,733	154	630	89.65	11.00	0	153
	FE_7_MSA_Toledo_L	5	2,586	2,106	233	320	98.50	2.59	0	
NYPP	NYISO_5_NYE	27	1,098	909	50	200	71.40	5.06	0	
	TVA_7_MSA_Memphis_L	15	7,215	5,982	76	177	47.86	22.92	0	
	WPS_4_MSA_Marshfield_L	11	411	442	16	38		6.75	0	
	NYISO_9_NYI	317	2	1,476	0	2		13.33	0	
	OKGE_4_MSA_OklahomaCity_L	1	2,102	2,403	3	3			0	
	WEPL_7_MSA_DodgeCity_G	1	137	124	3	3			0	.00
SPP	WERE_5_MSA_KansasCity_L	1	204	915	12	12	18.84		0	161

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2008R2

			0			NA N. 4		Б.		Rank
			Gen	Load	Avg net	Max Net	ъ.	Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359		38.79	10.54	,	1
	SOCO_26_MSA_Macon_G	8784	6,802		5,108	6,282	42.24	10.99	,	
	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38	11.09		
PJM	PJM500_8_MSA_Philadelphia_G	8784	3,914	-	3,139	3,868	50.68	13.47	1,398	
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,288	6,493	47.58	12.25		
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62	10.26		
	DUK_9_MSA_Charlotte_G	8783	14,681	9,966	3,042	5,492	42.51	11.57	1,136	
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,498	4,181	32.75	_	,	
PJM	PJM500_7_MSA_York-Hanover_G	8784	2,696	-	2,198	2,570	50.23	13.43		
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,424	3,969	43.51	10.71	926	
	NEPOOL_5_SEMA	8784	6,454	3,978	1,957	3,704	50.35	10.70		
FRCC	TECO_3_MSA_Tampa_G	8784	3,733	1,026	2,102	3,143	46.64	12.75		12
FRCC	FPL_8_MSA_PortStLucie_G	8751	10,364	4,623	2,026	5,279	46.99	12.82	833	
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	37.71	10.56		14
MISO	CIN_8_MSA_Evansville_G	8783	3,657	260	2,484	3,391	36.95	10.72	806	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76	10.44	771	16
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	8.83	762	
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	53.25	12.28	740	18
PJM	DPL_8_GEN_Killen_G	8759	2,964	-	2,042	2,940	38.65	10.49	691	19
PJM	PJM500_5_MSA_DC_G	8784	1,730	-	1,516	1,730	50.37	14.37	671	20
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	12.24	662	21
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,952	2,769	37.86	9.67	649	22
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923	2,287	38.10	10.80	643	23
PJM	PJM500_4_MSA_Philadelphia_G	8496	2,383	-	1,449	2,346	50.48	13.29	621	24
ONTARIO	IESO 6 G	8784	2,146	147	1,844	2,071	37.71	10.56	611	25
FRCC	FPC_2_MSA_HomosassaSprings_G	8784	1,584	-	1,423	1,584	45.85	11.97	573	26
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	-	1,473	1,700	44.08	11.54	570	27
VACAR	SCPSA_10_MSA_Charleston_G	8616	1,680	-	1,468	1,680	43.42	12.30	549	28
	NYISO 1 NYA	8323	4,946	2,500	1,595	2,319	40.13	8.85		
PJM	NI 7 MSA Rochelle G	8784	2,290	, -	2,119	2,290	28.20	14.28	525	
PJM	PJM500_3_MSA_Pittsburgh_G	8758	1,705	-	1,368	1,700	43.76	11.11	524	
PJM	VAP 7 G	7413	4,179	303	1,507	3,629	45.32	10.94		
_	SOCO 28 MSA Birmingham G	8616	2,535	1,090	1,342	1,917	41.83	10.44		
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496	1,895	35.70	12.25		
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,435	1,664	36.63	10.57	462	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
ENTERGY	LAGN_1_MSA_BatonRouge_G	8784	2,199	163	1,342	1,697	39.15	9.25	461	36
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	-	1,220	1,330		11.89		
MISO	ITC_7_MSA_Monroe_G	8712	1,500	-	1,307	1,500	38.03	11.08	433	
MISO	METC_4_MSA_Holland-GrandHaven_	6219	7,365	2,900	1,638	4,534	42.31	9.72	431	39
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	38.01	10.77	429	
FRCC	FPC_10_MSA_Lakeland_G	8093	3,561	747	1,116	2,047	47.21	12.10	426	41
MISO	ITC_3_MSA_Detroit_G	8784	3,815	1,600	1,252	1,948	38.23	11.08	421	42
	NEPOOL_2_NH	8501	4,204	2,621	1,014	1,816	48.52	9.85	418	43
	NI_15_MSA_Davenport_G	8670	2,479	-	1,728	2,314	27.04	13.13	405	44
MISO	FE_9_MSA_Weirton_G	8628	1,860	112	1,220	1,808	38.10	11.01	401	45
PJM	PEPCO_8_MSA_DC_G	8731	3,786	1,108	891	1,926	50.15	14.31	390	
VACAR	SCEG_1_MSA_Columbia_G	8372	4,954	2,752	1,018	2,380	44.04	12.42	375	
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,168	1,641	36.21	10.09	372	48
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	909	1,349	46.04	12.28	368	49
SPP	WERE_1_MSA_Manhattan_G	8739	2,988	409	1,343	2,277	31.03	13.17	364	50
MISO	IP_7_GEN_Baldwin_G	8784	1,900	444	1,189	1,478	34.72	11.30	363	51
ENTERGY	EES_8_MSA_BatonRouge_G	8520	1,060	-	1,059	1,060	39.11	9.36	353	52
ONTARIO	IESO_15_G	8396	1,964	3,375	1,094	2,054	37.72	10.76	347	53
VACAR	CPLE_1_MSA_Durham_G	7555	10,224	8,563	940	2,730	44.48	11.76	316	54
MISO	EKPC_8_MSA_Maysville_G	8784	1,396	272	927	1,366	38.73	10.51	315	
ENTERGY	EES_4_GEN_Ouachita_G	5357	6,345	2,417	1,375	3,621	42.08	8.82	310	56
PJM	NI_6_MSA_Chicago_G	8321	9,759	7,577	1,110	3,034	33.17	12.36	306	57
VACAR	DUK_5_MSA_Seneca_G	7142	1,911	-	954	1,911	44.65	11.48	304	58
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	894	1,236	39.85	9.96	288	59
FRCC	OUC_1_MSA_Orlando_G	8616	889	73	724	867	45.60	12.12	284	60
MISO	HE_9_MSA_TerreHaute_G	8496	1,016	27	865	999	36.95	10.71	271	61
NEPOOL	NEPOOL_7_CT	7667	4,447	3,920	690	1,740	50.04	11.20	265	62
MISO	BREC_3_County_Webster_G	8784	1,355	476	902	1,135	33.08	11.02	262	63
MISO	NIPS_8_MSA_Chicago_G	8760	2,892	1,694	920	1,665	31.13	12.96	251	64
MISO	IP_8_GEN_Clinton_G	8011	2,302	1,195	917	1,230	33.74	11.48	248	65
NYPP	NYISO_6_NYF	7778	4,103	1,983	618	1,759	49.25	9.16	237	66
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,138	28.23	12.38	222	67
PJM	NI_20_MSA_Chicago_G	7234	1,632	83	896	1,571	33.43	12.44	217	68
MISO	CIN_3_MSA_TerreHaute_G	6968	3,230	1,015	796	2,234	38.21	10.56	212	69
PJM	PL_8_MSA_Allentown_G	7726	2,853	385	537	2,281	50.69	13.16	210	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	KEY_1_MSA_KeyWest_G	8249	880	138	517	811	48.65	16.32	207	71
PJM	BGE_7_MSA_Baltimore-Towson_G	7066	2,548	1,043	549	1,095	51.17	14.13	198	
PJM	PENELEC_2_MSA_DuBois_G	7753	2,724	1,196	568	1,591	44.34	10.51	195	73
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	10.04	193	
MAPP	MEC_3_MSA_DesMoines_G	8009	3,307	1,933	939	1,547	24.54	12.90	185	75
SOUTHERN		8783	903	60	472	858	41.62	10.55	172	76
MISO	AMRN_12_MSA_StLouis_L	6702	5,059	6,066	757	1,937	31.17	9.32	158	77
	SOCO_2_GEN_Hartwll_G	2829	2,186	46	1,069	1,639	51.19	9.62	155	78
PJM	PECO_1_MSA_Philadelphia_G	3734	2,323	554	734	1,126	55.03	11.60	151	79
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	590	1,099	29.01	12.69	147	80
FRCC	NSB_1_MSA_DaytonaBeach_G	7323	514	86	417	513	47.19	11.67	144	81
FRCC	LAK_1_MSA_Lakeland_G	8571	819	28	347	527	46.38	12.05	138	
SPP	AEPW_9_MSA_MountPleasant_G	6984	8,168	3,832	534	1,673	36.63	8.56	137	83
SPP	KACP_4_MSA_KansasCity_G	7656	670	-	639	670	26.16	14.21	128	84
SPP	CELE_10_MSA_Alexandria_G	8586	1,895	742	356	1,228	40.95	14.44	125	85
NYPP	NYISO_4_NYD	7672	1,206	681	662	935	24.58	21.19	125	86
MISO	OTP_9_GEN_BigStone_G	8784	1,189	136	737	1,096	18.91	6.71	122	87
SPP	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60	8.81	100	88
PJM	OVEC_3_G	2340	1,620	10	846	1,057	47.07	9.04	93	89
MISO	EEI_2_MSA_Paducah_G	8784	507	36	279	472	36.04	11.26	88	90
SPP	GRDA_2_G	7602	849	179	318	676	36.15	9.32	87	91
MISO	CILC_8_MSA_Peoria_G	8032	756	349	318	594	33.42	11.98	85	92
PJM	VAP_26_MSA_DC_G	5811	1,981	631	252	494	51.80	13.05	76	93
FRCC	GVL_3_MSA_Gainesville_G	7608	433	15	212	299	46.22	12.17	75	94
MISO	DPC_10_G	7833	615	140	317	512	28.41	14.02	71	95
FRCC	TAL_3_MSA_Tallahassee_G	8190	336	-	186	262	45.26	11.72	69	96
MAPP	NPPD_4_GEN_Gentleman_G	8760	2,702	148	626	1,477	12.49	9.31	69	97
FRCC	LWU_1_MSA_Miami_G	6592	250	82	198	249	51.25	15.69	67	98
VACAR	CPLW 3 Asheville G	6202	764	93	231	642	43.57	11.89	62	99
MISO	XEL_3_MSA_Minneapolis_G	4129	7,596	7,622	812	1,981	17.84	6.21	60	100
MISO	MIPU 7 MSA KansasCity G	4891	1,307	437	310	690	38.87	12.76	59	101
FRCC	KIS_10_MSA_Orlando_G	5222	410	-	214	290	51.74	10.77	58	102
SPP	SPS_2_GEN_Tolk1_G	5527	4,480	2,973	152	620	62.94	8.61	53	
NEPOOL	NEPOOL 3 ME	3752	3,494	2,522	297	1,074	46.10	9.34	51	104
SPP	SWPA_2_MSA_MountainHome_G	5258	478	70	356	450	27.02	18.91	51	105

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2008R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
SPP	KACY_10_MSA_KansasCity_G	8784	316	40	151	189	34.35	14.21	45	
MISO	ALTW_6_MSA_CedarRapids_L	8223	996	1,103	194	413	26.92	11.44		
NEPOOL	NEPOOL_10_RI	2541	2,062	2,203	309	988	52.06	8.59	41	108
MAPP	WAPA_2_MSA_RapidCity_G	3256	2,405	813	587	773	20.89	7.90	40	
	EES_7_MSA_Beaumont-PortArthur_G	2642	7,393	4,949	345	1,123	42.89	5.70	39	
	NEPOOL_8_SWCT	2913	2,678	1,850	202	880	55.91	11.17	33	
SPP	WERE_4_GEN_Wolfcreek_G	5152	3,510	2,459	254	755	23.89	16.29	31	112
MISO	SIPC_9_MSA_Marion-Herrin_G	5819	432	37	139	327	36.84	11.79	30	113
NEPOOL	NEPOOL_1_VT	5105	821	1,115	110	391	46.82	10.24	26	
MAPP	MPW_1_MSA_Muscatine_G	7305	151	16	122	143	28.31	13.00	25	
SPP	EMDE_1_MSA_Joplin_G	4235	1,102	458	152	535	37.58	11.00	24	116
TVAUTHOR	TVA_9_MSA_Paducah_G	3814	4,470	2,130	142	700	38.82	10.79	21	117
ENTERGY	EES_9_MSA_Russellville_G	2477	6,123	4,517	196	1,183	35.02	10.66	17	118
SPP	LAFA_7_MSA_Lafayette_G	2863	175	-	92	175	62.61	34.62	17	119
PJM	METED_4_MSA_Reading_G	2135	913	854	134	392	57.15	11.85	16	120
VACAR	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62	8.91	16	121
SPP	AEPW_1_MSA_Tulsa_G	1628	3,295	2,000	235	909	41.35	10.59	16	122
MISO	FE_5_MSA_Cleveland_L	2145	3,216	4,680	218	755	32.53	8.49	15	123
SOUTHERN	SOCO_17_MSA_Mobile_G	1104	5,205	4,575	258	1,043	51.88	10.70	15	124
MISO	CWLP_1_MSA_Springfield_G	3272	310	227	83	168	42.03	9.98	11	125
NYPP	NYISO_7_NYG	364	3,156	2,195	450	1,107	68.36	8.63	11	126
SPP	SPRM_10_MSA_Springfield_L	5759	236	346	53	159	33.11	9.01	10	127
MISO	CIN_4_MSA_Cincinnati-Middletown_G	1012	6,026	5,727	240	893	39.57	7.72	10	128
SPP	INDN_6_MSA_KansasCity_G	8574	143	27	30	124	33.62	13.31	9	129
MISO	WEC_7_MSA_Milwaukee_G	1082	3,850	3,052	194	931	37.08	15.98	8	130
MISO	SUNC_3_MSA_GardenCity_G	1262	840	18	96	198	56.39	13.18	7	131
PJM	PECO_5_MSA_Philadelphia_L	1799	1,656	2,510	106	295	35.47	8.73	7	132
PJM	AEP_3_MSA_Columbus_L	428	10,204	8,244	326	1,547	46.22	6.66	6	133
MISO	METC 8 MSA BayCity G	665	3,795	2,562	185	674	50.10	15.49	6	134
FRCC	FMP 8 MSA Sebastian G	1814	145	20	37	65	70.97	13.95	5	135
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	1106	3,431	4,125	140	401	28.72	5.26	4	
FRCC	FPL_2_MSA_FortMyers_G	320	5,929	4,563	209	902	49.88	5.93	3	
TVAUTHOR	BCA 1 GEN NRGBatesville G	720	87	14	54	69	54.09	7.58	2	
MISO	WEC 3 MSA Milwaukee G	1576	1,429	2,423	73	258	17.53	3.13	2	
TVAUTHOR		217	9,154	8,858	216	912	37.72	6.32	2	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2008R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	FTP 7 MSA PortStLucie G	551	93	(10100)	36	37		,	2	_
	NEPOOL_6_WCMA	77	4,285	3,417	343	957	59.72	5.94	2	
	LES_5_MSA_Lincoln_G	223	264	108	90	183		5.23	1	143
	NEPOOL_4_NEBOS	153	3,262	5,904	199	829	43.17	1.88	1	144
	MGE_7_MSA_Madison_L	968	399	403	31	132	43.06	4.82	1	145
ONTARIO	IESO_2_G	92	2,437	2,116	295	995	45.52	4.70	1	146
SPP	OMPA_9_MSA_PoncaCity_G	700	163	147	20	100	73.10	13.47	1	147
MISO	SMMPA_9_MSA_Rochester_G	177	128	58	72	83	64.74	7.14	1	148
MISO	ITC_2_MSA_Detroit_L	246	4,001	5,247	81	276	24.81	4.41	0	149
	DERS_1_MSA_Ruston_G	318	75	68	21	37	66.47	12.82	0	150
VACAR	SCEG_9_MSA_Charleston_G	173	1,152	1,944	51	197	38.00	7.81	0	151
PJM	DP&L_6_MSA_Seaford_L	119	1,438	1,523	45	173	45.79	11.51	0	
	WEPL_7_MSA_DodgeCity_G	128	137	124	29	58	61.96	2.29	0	153
TVAUTHOR	TVA_7_MSA_Memphis_L	59	7,215	5,982	82	281	37.75	10.00	0	
	SOCO_21_MSA_Atlanta_G	8	3,334	2,733	152	400	65.23	0.40	0	155
	FE_7_MSA_Toledo_L	16	2,586	2,106	73	320	53.79	10.84	0	
	NYISO_5_NYE	20	1,098	909	44	200	46.40	3.94	0	
	OKGE_4_MSA_OklahomaCity_L	11	2,102	2,403	23	66	57.10	3.26	0	
PJM	PSEG_8_MSA_NewYork_G	5	3,860	3,654	33	47	58.22	3.41	0	
	WPS_4_MSA_Marshfield_L	3	411	442	17	21	65.52	1.04	0	
	FPL_3_MSA_Miami_L	1	6,944	7,089	28	28			0	
	NYISO_9_NYI	317	2	1,476	0	2	35.43	6.68	0	. 0 –
SPP	WERE_5_MSA_KansasCity_L	1	204	915	12	12	19.55		0	163

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	12.12	2,159	1
	SOCO_26_MSA_Macon_G	8760	6,802	-	5,111	6,381	44.23	11.99	1,980	
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15	12.02	1,639	3
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,443	6,047	50.33	12.71	1,518	
PJM	PJM500_8_MSA_Philadelphia_G	8760	3,914	-	3,130	3,758	52.08	13.12	1,428	5
	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,560	4,074	36.67	12.36	1,143	6
VACAR	DUK_9_MSA_Charlotte_G	8544	14,681	9,966	3,002	5,557	43.40	11.61	1,113	7
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	11.46	1,092	8
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,676	3,904	44.26	11.42	1,038	9
ONTARIO	IESO_7_G	8760	2,953	253	2,506	2,829	44.11	9.84	968	10
ONTARIO	IESO_6_G	8760	2,146	147	2,493	2,787	44.10	9.83	963	11
PJM	PJM500_7_MSA_York-Hanover_G	8760	2,696	-	2,071	2,570	52.28	13.51	948	12
FRCC	TECO_3_MSA_Tampa_G	8760	3,733	1,026	2,110	3,221	50.28	13.66	929	13
NEPOOL	NEPOOL_5_SEMA	8760	6,454	3,978	1,839	3,523	51.63	10.77	832	14
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,516	3,391	37.24	11.57	821	15
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46	9.35	806	16
FRCC	FPL_8_MSA_PortStLucie_G	8660	10,364	4,623	1,803	4,746	50.91	13.58	795	17
PJM	DPL_8_GEN_Killen_G	8760	2,964	-	2,196	2,940	40.15	11.89	772	18
PJM	PJM500_4_MSA_Philadelphia_G	8690	2,383	-	1,675	3,295	52.22	13.45	760	19
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	11.99	745	20
PJM	PJM500_5_MSA_DC_G	8760	1,730	-	1,600	1,730	52.91	14.44	742	21
NYPP	NYISO_8_NYH	8760	2,021	973	1,570	1,958	53.34	12.13	734	22
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	11.56	708	23
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,926	2,737	40.63	11.57	684	24
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34	11.29	681	25
PJM	NI_7_MSA_Rochelle_G	8760	2,290	-	2,119	2,290	32.91	12.50	611	26
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86	9.00	609	27
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	-	1,492	1,700	44.80	11.75	579	28
FRCC	FPC_2_MSA_HomosassaSprings_G	8544	1,584	-	1,364	1,584	49.56	13.05	577	29
PJM	VAP 7 G	6808	4,179	303	1,699	3,608	48.73	11.57	564	30
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	-	1,440	1,700	44.47	11.47	561	31
VACAR	SCPSA_10_MSA_Charleston_G	8760	1,680	-	1,428	1,680	44.59	11.83	558	32
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76	11.50	508	33
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,346	1,750	42.43	10.52	500	34
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	36.63	12.12	499	35

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	SEC_6_MSA_Palatka_G	8760	1,330	-	1,135	1,330	50.10	13.39	498	
	FE_9_MSA_Weirton_G	8760	1,860	112	1,388	1,802	40.46	11.33	492	37
	OUC_1_MSA_Orlando_G	8688	889	73	1,108	1,487	49.40	13.42	475	
	ITC_7_MSA_Monroe_G	8472	1,500	-	1,344	1,500	41.48	11.72	472	39
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,414	1,664	37.13	11.20	460	
	ITC_3_MSA_Detroit_G	8745	3,815	1,600	1,235	2,005	41.95	11.73	453	41
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	40.16	11.30	452	42
PJM	NI_15_MSA_Davenport_G	8712	2,479	-	1,684	2,314	30.23	11.99	444	43
MISO	METC_4_MSA_Holland-GrandHaven_	6132	7,365	2,900	1,463	4,452	45.96	10.25	412	
PJM	PEPCO_8_MSA_DC_G	8628	3,786	1,108	904	1,788	52.83	14.31	412	45
ENTERGY	EES_4_GEN_Ouachita_G	6486	6,345	2,417	1,390	3,642	44.78	10.06	404	
NEPOOL	NEPOOL_2_NH	8396	4,204	2,621	933	1,787	49.91	9.91	391	47
VACAR	SCEG_1_MSA_Columbia_G	8179	4,954	2,752	1,057	2,537	45.11	12.31	390	48
FRCC	JEA_6_MSA_Jacksonville_G	8760	1,665	358	873	1,331	50.54	13.86	386	
ENTERGY	EES_8_MSA_BatonRouge_G	8496	1,060	-	1,059	1,060	42.39	10.55	381	50
SPP	WERE_1_MSA_Manhattan_G	8641	2,988	409	1,327	2,260	31.79	15.27	365	
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,080	1,590	37.65	10.91	356	52
VACAR	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	11.99	336	53
PJM	PENELEC_2_MSA_DuBois_G	8601	2,724	1,196	846	1,678	45.79	10.97	333	
MISO	IP_7_GEN_Baldwin_G	8760	1,900	444	1,150	1,478	32.77	11.26	330	
VACAR	DUK_5_MSA_Seneca_G	6597	1,911	-	1,031	1,911	47.89	10.75	326	
FRCC	FPC_10_MSA_Lakeland_G	8347	3,561	747	734	1,471	50.58	13.52	310	57
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	11.01	302	58
MISO	EKPC_8_MSA_Maysville_G	8760	1,396	272	837	1,091	39.94	11.86	293	59
MISO	BREC_3_County_Webster_G	8760	1,355	476	879	1,156	35.98	11.47	277	60
MISO	HE_9_MSA_TerreHaute_G	8688	1,016	27	840	997	37.57	11.69	274	61
PJM	NI_6_MSA_Chicago_G	7665	9,759	7,577	946	3,023	37.14	12.44	269	
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	911	1,379	34.17	13.71	268	63
MISO	NIPS_8_MSA_Chicago_G	8658	2,892	1,694	844	1,541	36.43	12.52	266	64
MISO	IP_8_GEN_Clinton_G	8002	2,302	1,195	927	1,212	35.59	12.10	264	65
PJM	NI_20_MSA_Chicago_G	7874	1,632	83	888	1,578	36.53	12.37	256	66
PJM	BGE_7_MSA_Baltimore-Towson_G	7816	2,548	1,043	608	1,238	53.27	14.16	253	67
	NEPOOL_7_CT	7199	4,447	3,920	629	1,694	51.70	11.40	234	
NYPP	NYISO_6_NYF	7576	4,103	1,983	579	1,680	50.77	9.27	223	69
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	11.17	206	70

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	CIN_3_MSA_TerreHaute_G	6557	3,230	1,015	784	2,188	39.90	11.67	205	
SPP	AEPW_9_MSA_MountPleasant_G	7520	8,168	3,832	657	1,891	40.94	8.80	202	
SOUTHERN		8760	903	60	456	848	44.23	11.41	177	73
	PL_8_MSA_Allentown_G	7177	2,853	385	451	1,484	51.96	13.37	168	
	NSB_1_MSA_DaytonaBeach_G	7636	514	86	423	512	51.19	13.10	165	
	SOCO_2_GEN_Hartwll_G	2726	2,186	46	1,106	1,832	53.86	8.88	162	
FRCC	LAK_1_MSA_Lakeland_G	8646	819	28	364	591	50.09	13.22	158	
SPP	CELE_10_MSA_Alexandria_G	8325	1,895	742	394	962	44.87	15.44	147	78
SPP	KACP_4_MSA_KansasCity_G	7896	670	-	1,149	1,520	15.76	11.87	143	
NEPOOL	NEPOOL_8_SWCT	6096	2,678	1,850	412	1,717	55.63	10.38	140	
MISO	ALTE_2_MSA_Madison_G	8747	1,665	441	494	1,033	30.31	13.22	131	81
NYPP	NYISO_4_NYD	7573	1,206	681	657	959	25.39	22.00	126	
PJM	PECO_1_MSA_Philadelphia_G	2869	2,323	554	726	1,124	57.60	12.08	120	83
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41	9.03	119	84
MAPP	MEC_3_MSA_DesMoines_G	8427	3,307	1,933	601	1,391	22.45	10.69	114	85
MAPP	NPPD 4 GEN Gentleman G	8240	2,702	148	822	1,475	15.41	14.89	104	86
SPP	AEPW_5_MSA_Tulsa_G	7078	4,226	2,571	392	1,198	36.54	13.25	101	87
MISO	CILC_8_MSA_Peoria_G	8420	756	349	333	610	35.89	12.20	101	88
MISO	OTP_9_GEN_BigStone_G	8640	1,189	136	889	1,593	11.43	12.58	88	89
SPP	GRDA 2 G	7519	849	179	300	652	37.58	13.33	85	
MISO	EEI_2_MSA_Paducah_G	8486	507	36	284	473	34.94	12.28	84	91
VACAR	CPLW 3 Asheville G	7832	764	93	236	632	43.78	12.08	81	92
FRCC	GVL 3 MSA Gainesville G	7608	433	15	208	292	49.88	13.28	79	
FRCC	TAL 3 MSA Tallahassee G	8131	336	_	191	262	48.61	12.99	75	
FRCC	LWU 1 MSA Miami G	7024	250	82	201	249	53.36	13.77	75	
FRCC	KIS 10 MSA Orlando G	7038	410	-	203	290	52.28	12.73	75	
PJM	OVEC_3_G	1644	1,620	10	891	1,458	50.99	9.73	75	
MISO	DPC_10_G	7075	615	140	303	513	33.64	16.60	72	
SPP	SPS 2 GEN Tolk1 G	6444	4,480	2,973	167	615	65.97	18.68	71	
PJM	VAP 26 MSA DC G	5459	1,981	631	229	863	54.83	13.14	69	
	MIPU 7 MSA KansasCity G	4381	1,307	437	313	779	44.85	15.87	62	
	TVA_9_MSA_Paducah_G	6786	4,470	2,130	213	1,064	41.70	13.26	60	
	KACY_10_MSA_KansasCity_G	8032	316	40	168	234	38.71	19.60	52	
NEPOOL	NEPOOL 3 ME	3621	3,494	2,522	285	1,072	48.84	8.90	50	
MAPP	WAPA_2_MSA_RapidCity_G	3177	2,405	813	581	920	23.23	9.18	43	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	ALTW_6_MSA_CedarRapids_L	7465	996	1,103	166	386	27.84	10.19	34	
	EES_7_MSA_Beaumont-PortArthur_G	2258	7,393	4,949	309	1,011	48.98	7.53	34	_
SPP	SWPA_2_MSA_MountainHome_G	5835	478	70	316	450	18.27	19.69	34	
MISO	CIN_4_MSA_Cincinnati-Middletown_G	2760	6,026	5,727	297	980	39.22	10.61	32	
MISO	SIPC_9_MSA_Marion-Herrin_G	5625	432	37	130	365	43.68	13.01	32	
MISO	XEL_3_MSA_Minneapolis_G	2885	7,596	7,622	602	1,657	17.87	6.16	31	111
	IESO_2_G	1918	2,437	2,116	284	1,026	51.27	6.17	28	
SPP	EMDE_1_MSA_Joplin_G	2780	1,102	458	220	661	45.62	12.62	28	113
	NEPOOL_10_RI	1981	2,062	2,203	254	662	53.64	8.27	27	114
MAPP	MPW_1_MSA_Muscatine_G	7129	151	16	124	143	30.41	11.74	27	115
NEPOOL	NEPOOL_1_VT	4760	821	1,115	104	397	47.81	10.51	24	116
MISO	SUNC_3_MSA_GardenCity_G	2901	840	18	120	198	62.03	15.30	22	117
SPP	LAFA_7_MSA_Lafayette_G	3183	175	-	91	175	67.34	31.61	20	
SPP	WERE_4_GEN_Wolfcreek_G	4275	3,510	2,459	228	674	19.78	17.53	19	
	SOCO_17_MSA_Mobile_G	1382	5,205	4,575	254	951	52.83	11.56	19	120
MISO	WEC_3_MSA_Milwaukee_G	5624	1,429	2,423	147	513	22.33	10.46	18	121
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	10.65	18	122
	NYISO_7_NYG	596	3,156	2,195	430	1,026	66.53	9.03	17	123
PJM	AEP_3_MSA_Columbus_L	964	10,204	8,244	305	1,124	49.28	10.55	15	124
SPP	INDN_6_MSA_KansasCity_G	8734	143	27	45	127	36.60	17.44	14	125
VACAR	DUK_4_MSA_Greenville_L	1450	3,546	4,489	166	889	43.62	8.21	10	126
	METED_4_MSA_Reading_G	1310	913	854	114	303	56.85	7.92	8	127
SPP	SPRM_10_MSA_Springfield_L	4597	236	346	43	116	36.74	11.00	7	128
PJM	PECO_5_MSA_Philadelphia_L	1794	1,656	2,510	107	276	37.38	11.02	7	129
FRCC	FMP_8_MSA_Sebastian_G	2386	145	20	37	43	67.73	5.85	6	130
MISO	METC_8_MSA_BayCity_G	611	3,795	2,562	193	1,120	46.08	17.73	5	131
NEPOOL	NEPOOL_6_WCMA	206	4,285	3,417	275	1,241	60.98	8.56	3	132
TVAUTHOR	BCA_1_GEN_NRGBatesville_G	1058	87	14	55	70	56.71	7.43	3	133
SOUTHERN	SOCO_10_MSA_Albany-Valdosta_L	804	3,431	4,125	136	449	29.39	6.36	3	134
MISO	FE_5_MSA_Cleveland_L	720	3,216	4,680	122	435	33.79	7.67	3	135
SPP	AEPW_1_MSA_Tulsa_G	503	3,295	2,000	146	497	38.85	14.17	3	136
MISO	CWLP_1_MSA_Springfield_G	1299	310	227	38	77	46.91	5.86	2	137
SOUTHERN	SOCO_21_MSA_Atlanta_G	87	3,334	2,733	306	699	67.68	0.68	2	138
SPP	OMPA_9_MSA_PoncaCity_G	911	163	147	20	77	86.69	20.12	2	139
MISO	SMMPA_9_MSA_Rochester_G	242	128	58	74	89	75.21	13.29	1	140

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) BaseCase2011R2

	Source	Gen Weight	Load Weight	Avg net injection	Max Net injection	Price	Price Std.Dev	Revenue Surplus	Rank based on Revenue
		, ,	\ /		, ,	( '	\ /	(\$million)	Surplus
			2,106					1	141
			-					1	142
								1	143
								1	144
								1	145
								1	146
		,							
								0	
		,						0	
								0	
	218							0	
								0	
		1,152						0	
		2,102	2,403				12.13	0	155
	15	7,215	5,982	65	156	34.54	11.19	0	
NYISO_5_NYE	4	1,098	909	115	167	45.39	0.06	0	157
LES_5_MSA_Lincoln_G	2	264	108	56	77	66.26	0.50	0	158
UPPC_9_MSA_Houghton_L	5	2	75	2	3	165.32	13.21	0	159
	472	2	1,476	0	2	37.51	9.63	0	160
LEPA_5_MSA_Houma-Bayou_G	1	93	73	1	1	83.08		0	161
			_		_				
		Hub Name         Hrs           FE_7_MSA_Toledo_L         59           FTP_7_MSA_PortStLucie_G         339           MGE_7_MSA_Madison_L         635           DP&L_6_MSA_Seaford_L         280           LGEE_9_MSA_Louisville_G         405           DERS_1_MSA_Ruston_G         381           FPL_2_MSA_FortMyers_G         59           TVA_5_MSA_Nashville_L         83           WEPL_7_MSA_DodgeCity_G         191           ITC_2_MSA_Detroit_L         135           NEPOOL_4_NEBOS         33           WEC_7_MSA_Milwaukee_G         218           DOE_2_MSA_Paducah_G         6           SCEG_9_MSA_Charleston_G         91           OKGE_4_MSA_OklahomaCity_L         18           TVA_7_MSA_Memphis_L         15           NYISO_5_NYE         4           LES_5_MSA_Lincoln_G         2           UPPC_9_MSA_Houghton_L         5           NYISO_9_NYI         472	Hub Name         Source Hrs         Weight (MW)           FE_7_MSA_Toledo_L         59         2,586           FTP_7_MSA_PortStLucie_G         339         93           MGE_7_MSA_Madison_L         635         399           DP&L_6_MSA_Seaford_L         280         1,438           LGEE_9_MSA_Louisville_G         405         1,136           DERS_1_MSA_Ruston_G         381         75           FPL_2_MSA_FortMyers_G         59         5,929           TVA_5_MSA_Nashville_L         83         9,154           WEPL_7_MSA_DodgeCity_G         191         137           ITC_2_MSA_Detroit_L         135         4,001           NEPOOL_4_NEBOS         33         3,262           WEC_7_MSA_Milwaukee_G         218         3,850           DOE_2_MSA_Paducah_G         6         520           SCEG_9_MSA_Charleston_G         91         1,152           OKGE_4_MSA_OklahomaCity_L         18         2,102           TVA_7_MSA_Memphis_L         15         7,215           NYISO_5_NYE         4         1,098           LES_5_MSA_Lincoln_G         2         264           UPPC_9_MSA_Houghton_L         5         2           NYISO_9_NYI         472	Hub Name         Source Hrs         Weight (MW)         Weight (MW)           FE_7_MSA_Toledo_L         59         2,586         2,106           FTP_7_MSA_PortStLucie_G         339         93         -           MGE_7_MSA_Madison_L         635         399         403           DP&L_6_MSA_Seaford_L         280         1,438         1,523           LGEE_9_MSA_Louisville_G         405         1,136         1,763           DERS_1_MSA_Ruston_G         381         75         68           FPL_2_MSA_FortMyers_G         59         5,929         4,563           TVA_5_MSA_Nashville_L         83         9,154         8,858           WEPL_7_MSA_DodgeCity_G         191         137         124           ITC_2_MSA_Detroit_L         135         4,001         5,247           NEPOOL_4_NEBOS         33         3,262         5,904           WEC_7_MSA_Milwaukee_G         218         3,850         3,052           DOE_2_MSA_Paducah_G         6         520         309           SCEG_9_MSA_Charleston_G         91         1,152         1,944           OKGE_4_MSA_OklahomaCity_L         18         2,102         2,403           TVA_7_MSA_Memphis_L         15         7,	Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)           FE_7_MSA_Toledo_L         59         2,586         2,106         233           FTP_7_MSA_PortStLucie_G         339         93         -         35           MGE_7_MSA_Madison_L         635         399         403         25           DP&L_6_MSA_Seaford_L         280         1,438         1,523         57           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55           DERS_1_MSA_Ruston_G         381         75         68         20           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141           TVA_5_MSA_Nashville_L         83         9,154         8,858         162           WEPL_7_MSA_DodgeCity_G         191         137         124         30           ITC_2_MSA_Detroit_L         135         4,001         5,247         69           NEPOOL_4_NEBOS         33         3,262         5,904         146           WEC_7_MSA_Milwaukee_G         218         3,850         3,052         65           DOE_2_MSA_Paducah_G         6         520         309         409           SCEG_9_MSA_Charl	Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493           FTP_7_MSA_PortStLucie_G         339         93         -         35         37           MGE_7_MSA_Madison_L         635         399         403         25         101           DP&L_6_MSA_Seaford_L         280         1,438         1,523         57         186           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225           DERS_1_MSA_Ruston_G         381         75         68         20         35           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623           TVA_5_MSA_Nashville_L         83         9,154         8,858         162         529           WEPL_7_MSA_DodgeCity_G         191         137         124         30         78           ITC_2_MSA_Detroit_L         135         4,001         5,247         69         302           NEPC_7_MSA_Milwaukee_G         218         3,850         3,052         65         337           DOE_2_MSA_Paducah_G         6         520 <td>Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16           DP&amp;L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07           TVA_5_MSA_Nashville_L         83         9,154         8,858         162         529         30.15           WEPL_7_MSA_DodgeCity_G         191         137         124         30         78         69.73           ITC_2_MSA_Detroit_L         135         4,001         5,247         69         302         26.67</td> <td>Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)         Std.Dev (MWh)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47         8.02           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33         10.80           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16         5.41           DP&amp;L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21         10.50           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84         9.21           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08         10.33           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07         6.80           TVA_5_MSA_Nashville_L         83         9,154         8,858         162         529         30.15         4.55           WED_7_MSA_DedgeCity_G         191         137         124         30         78</td> <td>Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)         Std.Dev (MWh)         Surplus (\$million)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47         8.02         1           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33         10.80         1           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16         5.41         1           DP&amp;L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21         10.50         1           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84         9.21         1           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08         10.33         1           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07         6.80         0           WEPL_7_MSA_DageCity_G         191         137         124         30         78         69.73         5.55</td>	Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16           DP&L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07           TVA_5_MSA_Nashville_L         83         9,154         8,858         162         529         30.15           WEPL_7_MSA_DodgeCity_G         191         137         124         30         78         69.73           ITC_2_MSA_Detroit_L         135         4,001         5,247         69         302         26.67	Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)         Std.Dev (MWh)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47         8.02           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33         10.80           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16         5.41           DP&L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21         10.50           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84         9.21           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08         10.33           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07         6.80           TVA_5_MSA_Nashville_L         83         9,154         8,858         162         529         30.15         4.55           WED_7_MSA_DedgeCity_G         191         137         124         30         78	Hub Name         Source Hrs         Weight (MW)         Weight (MW)         injection (MW)         Price (\$/MWh)         Std.Dev (MWh)         Surplus (\$million)           FE_7_MSA_Toledo_L         59         2,586         2,106         233         493         69.47         8.02         1           FTP_7_MSA_PortStLucie_G         339         93         -         35         37         76.33         10.80         1           MGE_7_MSA_Madison_L         635         399         403         25         101         47.16         5.41         1           DP&L_6_MSA_Seaford_L         280         1,438         1,523         57         186         43.21         10.50         1           LGEE_9_MSA_Louisville_G         405         1,136         1,763         55         225         24.84         9.21         1           DERS_1_MSA_Ruston_G         381         75         68         20         35         70.08         10.33         1           FPL_2_MSA_FortMyers_G         59         5,929         4,563         141         623         52.07         6.80         0           WEPL_7_MSA_DageCity_G         191         137         124         30         78         69.73         5.55

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2011R2

SOUTHERN SOCO PJM VAP_SOUTHERN SOCO PJM PJM5 VACAR DUK_PJM NI_2_TVAUTHOR TVA_PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECO NYPP NYIS	Hub Name  P_8_GEN_Amos01_G  DCO_26_MSA_Macon_G  P_1_MSA_Richmond_G  DCO_31_MSA_Atlanta_G  M500_8_MSA_Philadelphia_G  UK_9_MSA_Charlotte_G  2_MSA_Chicago_G  A_1_MSA_Chatt-Hunts_G  P_1_County_Harrison_G  M500_7_MSA_York-Hanover_G	Source Hrs 8760 8760 8760 8760 8760 8549 8760 8754	Gen Weight (MW) 19,694 6,802 10,524 11,765 3,914 14,681 5,342	Load Weight (MW) 6,544 - 3,579 1,583	Avg net injection (MW) 5,868 5,110 3,543 4,179	Max Net injection (MW) 10,212 6,381 6,081 9,751	Price (\$/MWh) 50.44 55.47 66.00	Price Std.Dev (MWh) 20.34 19.59 21.85	Revenue Surplus (\$million) 2,593 2,483 2,048	based on Revenue Surplus 1 2 3
PJM AEP_ SOUTHERN SOCG PJM VAP_ SOUTHERN SOCG PJM PJMS VACAR DUK_ PJM NI_2_ TVAUTHOR TVA_ PJM AP_1 PJM PJMS ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	P_8_GEN_Amos01_G DCO_26_MSA_Macon_G P_1_MSA_Richmond_G DCO_31_MSA_Atlanta_G M500_8_MSA_Philadelphia_G UK_9_MSA_Charlotte_G 2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G DCO_31_MSA_York-Hanover_G	Hrs 8760 8760 8760 8760 8760 8760 8549 8760	(MW) 19,694 6,802 10,524 11,765 3,914 14,681	(MW) 6,544 - 3,579 1,583	(MW) 5,868 5,110 3,543 4,179	(MW) 10,212 6,381 6,081	(\$/MWh) 50.44 55.47 66.00	(MWh) 20.34 19.59 21.85	(\$million) 2,593 2,483 2,048	Surplus 1 2
PJM AEP_ SOUTHERN SOCG PJM VAP_ SOUTHERN SOCG PJM PJMS VACAR DUK_ PJM NI_2_ TVAUTHOR TVA_ PJM AP_1 PJM PJMS ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	P_8_GEN_Amos01_G DCO_26_MSA_Macon_G P_1_MSA_Richmond_G DCO_31_MSA_Atlanta_G M500_8_MSA_Philadelphia_G UK_9_MSA_Charlotte_G 2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G DCO_31_MSA_York-Hanover_G	8760 8760 8760 8760 8760 8549 8760	19,694 6,802 10,524 11,765 3,914 14,681	6,544 - 3,579 1,583	5,868 5,110 3,543 4,179	10,212 6,381 6,081	50.44 55.47 66.00	20.34 19.59 21.85	2,593 2,483 2,048	1 2
SOUTHERN SOCO PJM VAP_SOUTHERN SOCO PJM PJM5 VACAR DUK_PJM NI_2_TVAUTHOR TVA_PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECO NYPP NYIS	DCO_26_MSA_Macon_G P_1_MSA_Richmond_G DCO_31_MSA_Atlanta_G M500_8_MSA_Philadelphia_G UK_9_MSA_Charlotte_G 2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G D_1_County_Harrison_G M500_7_MSA_York-Hanover_G	8760 8760 8760 8760 8549 8760	6,802 10,524 11,765 3,914 14,681	3,579 1,583	5,110 3,543 4,179	6,381 6,081	55.47 66.00	19.59 21.85	2,483 2,048	
PJM VAP_ SOUTHERN SOCO PJM PJM5 VACAR DUK_ PJM NI_2_ TVAUTHOR TVA_ PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECO NYPP NYIS NYPP NYIS	P_1_MSA_Richmond_G DCO_31_MSA_Atlanta_G M500_8_MSA_Philadelphia_G IK_9_MSA_Charlotte_G 2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G '_1_County_Harrison_G M500_7_MSA_York-Hanover_G	8760 8760 8760 8549 8760	10,524 11,765 3,914 14,681	1,583 -	3,543 4,179	6,081	66.00	21.85	2,048	
SOUTHERN SOCO PJM PJM5 VACAR DUK_ PJM NI_2_ TVAUTHOR TVA_ PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECO NYPP NYIS NYPP NYIS	MSA_Atlanta_G M500_8_MSA_Philadelphia_G  JK_9_MSA_Charlotte_G _2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G _1_County_Harrison_G M500_7_MSA_York-Hanover_G	8760 8760 8549 8760	11,765 3,914 14,681	1,583 -	4,179					ં રા
PJM PJM5 VACAR DUK_ PJM NI_2 TVAUTHOR TVA_ PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	M500_8_MSA_Philadelphia_G  JK_9_MSA_Charlotte_G _2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G _1_County_Harrison_G  M500_7_MSA_York-Hanover_G	8760 8549 8760	3,914 14,681	-		0.7511				
VACAR DUK_PJM NI_2_TVAUTHOR TVA_PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	JK_9_MSA_Charlotte_G _2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G _1_County_Harrison_G M500_7_MSA_York-Hanover_G	8549 8760	14,681	-			55.29	19.58	2,024	4
PJM NI_2_TVAUTHOR TVA_PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	_2_MSA_Chicago_G A_1_MSA_Chatt-Hunts_G '_1_County_Harrison_G M500_7_MSA_York-Hanover_G	8760			3,130	3,868	70.63	23.39	1,937	5
TVAUTHOR TVA_PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	A_1_MSA_Chatt-Hunts_G '_1_County_Harrison_G M500_7_MSA_York-Hanover_G		5 2/2	9,966	3,071	5,821	54.45	19.37	1,429	6
PJM AP_1 PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS	_1_County_Harrison_G M500_7_MSA_York-Hanover_G	8754		1,283	3,559	4,074	45.36	20.35	1,414	7
PJM PJM5 ONTARIO IESO ONTARIO IESO FRCC TECO NYPP NYIS NYPP NYIS	M500_7_MSA_York-Hanover_G		17,334	9,966	2,978	7,160	52.39	19.08	1,366	8
ONTARIO IESO ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS		8760	6,563	2,223	2,674	3,962	56.52	20.13	1,324	9
ONTARIO IESO FRCC TECC NYPP NYIS NYPP NYIS		8760	2,696	-	2,070	2,570	70.66	23.89	1,282	10
FRCC TECC NYPP NYIS NYPP NYIS	SO_7_G	8760	2,953	253	2,506	2,829	56.39	17.22	1,238	11
NYPP NYIS	SO_6_G	8760	2,146	147	2,493	2,787	56.38	17.21	1,231	12
NYPP NYIS	CO_3_MSA_Tampa_G	8760	3,733	1,026	2,088	3,258	65.15	21.29	1,191	13
	ISO_3_NYC	8760	6,711	2,657	1,926	2,870	65.56	16.17	1,106	14
	ISO_8_NYH	8760	2,021	973	1,570	1,958	75.23	21.65	1,035	15
FRCC FPL_	L_8_MSA_PortStLucie_G	8628	10,364	4,623	1,804	5,105	66.17	21.40	1,030	16
MISO CIN_	N_8_MSA_Evansville_G	8760	3,657	260	2,511	3,387	45.87	19.05	1,009	17
	M500_5_MSA_DC_G	8760	1,730	-	1,600	1,730	70.80	24.98	992	18
NEPOOL NEPO	POOL_5_SEMA	8739	6,454	3,978	1,588	3,670	71.41	18.75	991	19
PJM DPL_	L_8_GEN_Killen_G	8760	2,964	-	2,218	2,940	49.86	19.97	969	20
PJM PJM5	M500_4_MSA_Philadelphia_G	8645	2,383	-	1,579	3,295	70.92	23.66	968	21
TVAUTHOR TVA_	A_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	19.68	944	22
ENTERGY EES_	S_2_MSA_Batesville_G	8743	3,525	1,697	1,923	2,737	51.76	18.69	870	23
MISO FE_6	_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02	19.14	827	24
NYPP NYIS	ISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80	16.32	791	25
SOUTHERN SOC	OCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	19.13	788	26
FRCC FPC	C_2_MSA_HomosassaSprings_G	8544	1,584	_	1,373	1,584	64.20	20.78	753	27
	7_MSA_Rochelle_G	8760	2,290	-	2,119	2,290	40.58	19.78	753	28
	P_7_G	6600	4,179	303	1,771	3,623	64.38	19.13	752	29
	M500_9_MSA_Pittsburgh_G	8664	1,700	-	1,490	1,700	57.05	20.55	736	30
	M500 3 MSA Pittsburgh G	8760	1,705	_	1,430	1,700	56.53	20.11	708	31
	CPSA 10 MSA Charleston G	8760	1,680	_	1,437	1,680	56.12	19.65	706	32
	OCO 28 MSA Birmingham G	8760	2,535	1,090	1,394	1,959	55.00	19.06	672	33
	GN_1_MSA_BatonRouge_G	8760	2,199	163	1,347	1,728	55.08	17.66	650	34
FRCC SEC	<u> </u>	8760	1,330	100	1,135	1,120	00.00			

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	OUC_1_MSA_Orlando_G	8688	889	73	1,109	1,487	63.86	21.07	615	
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,410	1,803	49.49	19.24		37
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	44.67	19.27	608	
MISO	ITC_7_MSA_Monroe_G	8472	1,500	-	1,344	1,500	51.90			39
	NEPOOL_2_NH	8425	4,204	2,621	1,000	1,918	68.48	17.25		40
MISO	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,234	1,928	52.63	20.11	568	
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,411	1,664	45.86	18.64	567	42
PJM	PEPCO_8_MSA_DC_G	8671	3,786	1,108	915	1,843	70.57	24.72	560	
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83	19.12	549	
PJM	NI_15_MSA_Davenport_G	8712	2,479	-	1,682	2,314	37.11	18.85	544	
PJM	PENELEC_2_MSA_DuBois_G	8745	2,724	1,196	1,004	1,719	59.08	18.95	519	46
VACAR	CPLE_1_MSA_Durham_G	7930	10,224	8,563	1,125	2,523	57.05	20.05	509	47
FRCC	JEA_6_MSA_Jacksonville_G	8760	1,665	358	872	1,331	65.21	21.67	498	48
ENTERGY	EES_8_MSA_BatonRouge_G	8496	1,060	-	1,059	1,060	54.99	17.70	495	
ENTERGY	EES_4_GEN_Ouachita_G	6519	6,345	2,417	1,268	3,688	58.18	15.93	481	50
MISO	METC_4_MSA_Holland-GrandHaven_	5811	7,365	2,900	1,373	4,452	59.66	17.76	476	51
SPP	WERE_1_MSA_Manhattan_G	8684	2,988	409	1,338	2,255	39.48	23.74	459	52
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,095	1,597	47.78	18.01	458	53
VACAR	SCEG_1_MSA_Columbia_G	7998	4,954	2,752	999	2,547	56.98	19.84	455	54
VACAR	DUK_5_MSA_Seneca_G	6330	1,911	-	1,074	1,911	62.14	16.93	422	55
MISO	IP_7_GEN_Baldwin_G	8760	1,900	444	1,149	1,478	40.47	17.98	407	56
FRCC	FPC_10_MSA_Lakeland_G	8320	3,561	747	721	1,471	65.71	20.98	394	57
PJM	BGE_7_MSA_Baltimore-Towson_G	8161	2,548	1,043	660	1,099	71.25	24.41	384	58
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	850	1,211	55.21	18.05	378	59
SPP	AEPW_9_MSA_MountPleasant_G	8404	8,168	3,832	852	2,045	52.70	13.73	377	60
MISO	EKPC_8_MSA_Maysville_G	8760	1,396	272	849	1,088	49.57	19.87	369	61
MISO	HE_9_MSA_TerreHaute_G	8688	1,016	27	840	997	46.26	19.25	338	62
MISO	NIPS_8_MSA_Chicago_G	8643	2,892	1,694	859	1,599	45.04	20.59	334	63
NEPOOL	NEPOOL_7_CT	7217	4,447	3,920	641	1,828	70.94	19.62	328	64
MISO	BREC 3 County Webster G	8760	1,355	476	891	1,191	41.70	16.98	325	65
MISO	IP_8_GEN_Clinton_G	7994	2,302	1,195	924	1,212	43.68	19.69		
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,394	40.89	21.09		
	NI_20_MSA_Chicago_G	7868	1,632	83	887	1,505	45.22	20.26		
NYPP	NYISO 6 NYF	7512	4,103	1,983	591	1,834	70.70	15.07	314	
PJM	NI_6_MSA_Chicago_G	7271	9,759	7,577	894	3,023	45.75	20.48		70

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2011R2

			Gen	Load	Avg net	Max Net		Price	Revenue	Rank based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	CIN 3 MSA TerreHaute G	6611	3,230	1,015	738	2,170		19.28	244	
SOUTHERN		8760	903	60	460	843		18.83	225	72
	NSB_1_MSA_DaytonaBeach_G	7633	514	86	422	513	66.56	20.47	214	
	SOCO_2_GEN_Hartwll_G	2726	2,186	46	1,107	1,836	70.67	13.48	213	
	SOCO 32 MSA Pascagoula G	7473	3,574	2,674	499	1,541	56.69	18.81	212	75
	NEPOOL 8 SWCT	6228	2,678	1,850	421	1,723	78.27	17.55	205	
	LAK 1 MSA Lakeland G	8637	819	28	363	601	64.95	20.83	204	77
	CELE 10 MSA Alexandria G	8293	1,895	742	372	959	59.85	25.35	185	
	PL 8 MSA Allentown G	6432	2,853	385	400	1,482	69.80	23.99	180	79
	NYISO_4_NYD	7615	1,206	681	662	908	34.59	31.38	175	
	ALTE_2_MSA_Madison_G	8749	1,665	441	498	1,033	37.26	19.63	162	81
	AEPW 5 MSA Tulsa G	7582	4,226	2,571	425	1,275	48.49	20.01	156	
	KACP 4 MSA KansasCity G	7896	670		1,121	1,520	16.87	16.96	149	83
	AMRN 12 MSA StLouis L	6286	5,059	6,066	623	1,639	36.94	15.07	145	
	PECO 1 MSA Philadelphia G	2264	2,323	554	720	1,108	82.50	18.49	134	85
	MEC 3 MSA DesMoines G	8371	3,307	1,933	588	1,348	26.64	16.43	131	86
	CILC 8 MSA Peoria G	8393	756	349	339	610	44.27	19.85	126	
	NPPD_4_GEN_Gentleman_G	8247	2,702	148	850	1,575	17.45	14.60	122	88
	CPLW_3_Asheville_G	8418	764	93	253	631	54.54	19.66	116	89
	GRDA 2 G	7622	849	179	295	654	49.48	20.68	111	
MISO	EEI_2_MSA_Paducah_G	8485	507	36	285	473	44.79	19.67	108	91
MISO	OTP_9_GEN_BigStone_G	8640	1,189	136	897	1,677	13.77	14.01	107	92
FRCC	GVL_3_MSA_Gainesville_G	7632	433	15	208	293	64.30	21.13	102	93
FRCC	LWU_1_MSA_Miami_G	7100	250	82	200	249	70.21	21.49	100	
FRCC	KIS_10_MSA_Orlando_G	6973	410	-	203	290	68.68	19.50	97	95
FRCC	TAL_3_MSA_Tallahassee_G	8003	336	-	188	262	62.61	21.10	94	
MISO	DPC_10_G	6991	615	140	308	513	42.72	24.90	92	97
NEPOOL	NEPOOL_3_ME	3787	3,494	2,522	344	1,072	67.04	15.82	87	98
TVAUTHOR	TVA_9_MSA_Paducah_G	6905	4,470	2,130	218	1,038	53.86	22.49	81	99
PJM	OVEC_3_G	1211	1,620	10	870	1,457	71.13	15.63	75	100
PJM	VAP_26_MSA_DC_G	4164	1,981	631	216	433	78.33	20.92	70	101
	MIPU_7_MSA_KansasCity_G	3681	1,307	437	286	741	63.74	23.34	67	102
SPP	SPS_2_GEN_Tolk1_G	5802	4,480	2,973	132	562	86.07	23.94	66	
	KACY_10_MSA_KansasCity_G	8032	316	40	166	198	49.21	30.28	66	
MISO	CIN_4_MSA_Cincinnati-Middletown_G	3287	6,026	5,727	326	1,172	49.71	17.94	53	105

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2011R2

			Can	Lood	Augmot	May Not		Drice	Davanua	Rank
		0	Gen	Load	Avg net	Max Net	Deina	Price	Revenue	based on
Naminat Anna	Lluk Nama	Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	SIPC_9_MSA_Marion-Herrin_G	6185	432	37	148	394	57.47	21.01	53	
MAPP	WAPA_2_MSA_RapidCity_G	3222	2,405	813	582	941	27.39	13.87	51	107
	SWPA_2_MSA_MountainHome_G	5837	478	70	314	450	23.79	27.43		
	NEPOOL_10_RI	2333	2,062	2,203	249	759	74.79	13.48		
	ALTW_6_MSA_CedarRapids_L	7509	996	1,103	166	386	33.25	15.93	41	110
	EES_7_MSA_Beaumont-PortArthur_G	1755	7,393	4,949	329	1,143	67.63	11.75		
	EMDE_1_MSA_Joplin_G	3860	1,102	458	170	661	58.04	18.71	38	
	SUNC_3_MSA_GardenCity_G	3914	840	18	139	199	69.82	21.45		
	IESO_2_G	1825	2,437	2,116	286	994	69.40	9.02	36	
	MPW_1_MSA_Muscatine_G	7140	151	16	124	143	37.73	18.63		
	XEL_3_MSA_Minneapolis_G	2891	7,596	7,622	612	1,771	18.39	7.81	33	
	NEPOOL_1_VT	4760	821	1,115	104	397	64.42	18.65		117
SPP	LAFA_7_MSA_Lafayette_G	3170	175	-	94	175	92.17	43.56	27	118
MISO	WEC_3_MSA_Milwaukee_G	6113	1,429	2,423	154	494	27.50	14.13	26	119
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	5,205	4,575	224	1,452	60.78	20.20	26	120
VACAR	DUK 4 MSA Greenville L	1928	3,546	4,489	223	924	56.82	13.01	24	121
PJM	AEP_3_MSA_Columbus_L	1303	10,204	8,244	293	1,281	60.22	17.60	23	122
SPP	INDN_6_MSA_KansasCity_G	8734	143	27	49	128	46.26	27.17	20	123
ENTERGY	EES_9_MSA_Russellville_G	2493	6,123	4,517	184	831	40.43	17.74	19	124
	WERE_4_GEN_Wolfcreek_G	4254	3,510	2,459	223	668	19.33	25.62	18	125
	NYISO 7 NYG	356	3,156	2,195	384	963	100.50	13.30	14	126
PJM	PECO_5_MSA_Philadelphia_L	2133	1,656	2,510	115	329	44.74	19.53	11	127
	SPRM 10 MSA Springfield L	4749	236	346	45	120	46.41	18.53	10	
	FMP 8 MSA Sebastian G	2366	145	20	37	90	92.32	10.57	8	
	FE 5 MSA Cleveland L	1190	3,216	4,680	137	564	42.42	15.39	7	130
	AEPW 1 MSA Tulsa G	734	3,295	2,000	165	975	55.90	18.84	7	131
	MGE_7_MSA_Madison_L	1645	399	403	66	157	58.79	7.62	6	
	METC 8 MSA BayCity G	587	3,795	2,562	182	1,110	58.63	30.03	6	
	METED 4 MSA Reading G	816	913	854	89	244	82.03	9.87	6	
	CWLP_1_MSA_Springfield_G	2084	310	227	44	77	59.01	9.28		
	BCA 1 GEN NRGBatesville G	1074	87	14	52	69	77.23	11.48		
	SOCO 10 MSA Albany-Valdosta L	913	3,431	4,125	139	449	31.16		4	
	FTP 7 MSA PortStLucie G	637	93	7,120	36	37	102.69	16.23		
	NEPOOL 6 WCMA	116	4,285	3,417	213	881	86.01	17.20		
	OMPA_9_MSA_PoncaCity_G	969	163	147	17	75		24.38		
SFF	OIVIFA_9_IVIOA_PUHCACILY_G	909	103	147	17	75	116.70	24.38		140

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) HighCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
MISO	SMMPA_9_MSA_Rochester_G	226	128	58	74	89	102.11	18.27	2	141
MISO	FE_7_MSA_Toledo_L	50	2,586	2,106	224	466	98.59	8.94	1	142
	DP&L_6_MSA_Seaford_L	411	1,438	1,523	48	177	54.21	18.52	1	143
	SOCO_21_MSA_Atlanta_G	44	3,334	2,733		582	90.11	9.86	1	144
MISO	LGEE_9_MSA_Louisville_G	454	1,136	1,763	63	225	28.97	14.89	1	145
ENTERGY	DERS_1_MSA_Ruston_G	337	75	68	20	37	95.42	10.87	1	146
TVAUTHOR	TVA_5_MSA_Nashville_L	114	9,154	8,858	154	573	32.28	8.81	1	147
	FPL_2_MSA_FortMyers_G	51	5,929	4,563	140	623	68.94	8.20	0	
	NEPOOL_4_NEBOS	45	3,262	5,904	154	490	62.24	4.67	0	
	SCEG_9_MSA_Charleston_G	189	1,152	1,944	40	140		12.05	0	
	ITC_2_MSA_Detroit_L	136	4,001	5,247	79	302	27.29	6.75	0	
	DOE_2_MSA_Paducah_G	9	520	309	323	465	94.08	0.16	0	
	WEC_7_MSA_Milwaukee_G	207	3,850	3,052	63	261	12.94	7.49	0	
MISO	LES_5_MSA_Lincoln_G	17	264	108	61	86	92.91	2.25	0	
	OKGE_4_MSA_OklahomaCity_L	23	2,102	2,403	43	125	96.84	12.07	0	
	WEPL_7_MSA_DodgeCity_G	38	137	124	23	38		4.18	0	. 00
	NYISO_5_NYE	4	1,098	909	115	167	62.16	0.34	0	
	TVA_7_MSA_Memphis_L	7	7,215	5,982	43	86	28.36	13.62	0	
	UPPC_9_MSA_Houghton_L	3	2	75	1	3	266.21	13.13	0	
NYPP	NYISO_9_NYI	472	2	1,476	0	2	43.95	17.93	0	160
					, and the second					

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	8.53	2,024	1
	SOCO_26_MSA_Macon_G	8760	6,802	-	5,102	6,381	39.15	9.06	1,750	
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09	9.08	1,474	
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,424	6,047	43.27	9.59	1,298	4
PJM	PJM500_8_MSA_Philadelphia_G	8760	3,914	-	3,132	3,868	44.43	9.58	1,219	5
	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,562	4,192	32.75	8.93	1,022	6
	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	8.20	1,012	7
	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	2,865	5,471	38.80	8.90	950	8
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81	8.12	889	9
ONTARIO	IESO_7_G	8760	2,953	253	2,506	2,829	38.04	7.04	835	10
ONTARIO	IESO_6_G	8760	2,146	147	2,493	2,787	38.03	7.03	830	11
FRCC	TECO_3_MSA_Tampa_G	8760	3,733	1,026	2,143	3,270	43.28	10.45	812	12
PJM	PJM500_7_MSA_York-Hanover_G	8760	2,696	-	2,072	2,570	44.70	9.97	811	13
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,521	3,388	33.40	8.48	738	14
NEPOOL	NEPOOL_5_SEMA	8757	6,454	3,978	1,898	3,583	43.66	8.15	726	15
FRCC	FPL_8_MSA_PortStLucie_G	8677	10,364	4,623	1,845	4,766	43.86	10.28	702	16
PJM	PJM500_4_MSA_Philadelphia_G	8702	2,383	-	1,806	3,346	44.57	9.92	700	17
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50	8.46	693	18
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,909	3,259	41.23	6.68	690	19
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	8.65	649	20
PJM	PJM500_5_MSA_DC_G	8760	1,730	-	1,600	1,730	45.52	11.02	638	21
PJM	DPL_8_GEN_Killen_G	8760	2,964	-	2,028	2,940	35.81	8.45	636	22
NYPP	NYISO_8_NYH	8760	2,021	973	1,570	1,958	45.29	9.15	623	23
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	36.50	8.38	616	24
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,929	2,737	34.97	8.49	590	25
PJM	NI_7_MSA_Rochelle_G	8760	2,290	-	2,119	2,290	29.24	9.29	543	26
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71	6.18	526	27
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	-	1,492	1,700	39.35	8.62	509	28
FRCC	FPC 2 MSA HomosassaSprings G	8544	1,584	-	1,359	1,584	42.67	9.73	496	29
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	-	1,438	1,700	39.08	8.30	492	30
VACAR	SCPSA_10_MSA_Charleston_G	8760	1,680	-	1,413	1,680	39.64	9.08	490	31
PJM	VAP_7_G	7408	4,179	303	1,507	3,608	41.18	8.57	460	32
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	33.05	9.20	450	33
	SOCO 28 MSA Birmingham G	8760	2,535	1,090	1,319	1,836	38.44	8.43	444	34
MISO	FE_9_MSA_Weirton_G	8741	1,860	112	1,342	1,795	36.50	8.35	428	35

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
FRCC	SEC_6_MSA_Palatka_G	8760	1,330	-	1,128	1,330		10.02	427	36
	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,347	1,726		7.95	426	
	METC_4_MSA_Holland-GrandHaven_	6489	7,365	2,900	1,642	4,626	39.38	7.41	420	38
MISO	ITC_7_MSA_Monroe_G	8472	1,500	-	1,344	1,500		8.29		39
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,417	1,664	33.29	8.16	413	
FRCC	OUC_1_MSA_Orlando_G	8680	889	73	1,119	1,487	42.51	10.14	413	41
	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	36.42	8.35	410	42
	NI_15_MSA_Davenport_G	8712	2,479	-	1,695	2,361	27.05	8.82	399	43
MISO	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,221	2,005	36.98	8.19	395	44
VACAR	SCEG_1_MSA_Columbia_G	8403	4,954	2,752	1,121	2,595	40.37	9.97	380	
	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	7.91	351	46
FRCC	JEA_6_MSA_Jacksonville_G	8760	1,665	358	870	1,331	43.60	10.48	332	47
ENTERGY	EES_8_MSA_BatonRouge_G	8496	1,060	-	1,059	1,060	36.11	8.01	325	48
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,108	1,604	32.71	7.78	317	49
PJM	PEPCO_8_MSA_DC_G	8111	3,786	1,108	833	1,790	45.73	11.07	309	50
NEPOOL	NEPOOL_2_NH	8300	4,204	2,621	857	1,787	42.24	7.29	300	51
MISO	IP_7_GEN_Baldwin_G	8760	1,900	444	1,151	1,478	29.17	8.24	294	52
SPP	WERE_1_MSA_Manhattan_G	8145	2,988	409	1,217	2,299	29.25	10.88	290	
VACAR	DUK_5_MSA_Seneca_G	7069	1,911	-	960	1,911	41.81	9.13	284	54
FRCC	FPC_10_MSA_Lakeland_G	8424	3,561	747	762	1,495	43.42	10.33	279	55
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	8.36	264	56
VACAR	CPLE_1_MSA_Durham_G	7537	10,224	8,563	879	2,332	39.61	9.22	262	57
	NI_6_MSA_Chicago_G	7988	9,759	7,577	995	2,915	32.98	8.96	262	58
MISO	EKPC_8_MSA_Maysville_G	8760	1,396	272	810	1,088	35.64	8.47	253	59
MISO	BREC_3_County_Webster_G	8760	1,355	476	855	1,129	32.98	8.94	247	60
MISO	HE_9_MSA_TerreHaute_G	8688	1,016	27	840	997	33.77	8.54	247	61
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	909	1,388	30.66	10.45	239	62
MISO	IP_8_GEN_Clinton_G	8009	2,302	1,195	927	1,213	31.99	8.77	238	63
MISO	NIPS_8_MSA_Chicago_G	8692	2,892	1,694	817	1,465	32.55	9.06	231	64
PJM	NI_20_MSA_Chicago_G	7900	1,632	83	892	1,578	32.69	9.00	230	65
PJM	PENELEC_2_MSA_DuBois_G	8368	2,724	1,196	670	1,568	40.01	8.03	224	66
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90	6.74	206	67
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60	8.28	194	68
NEPOOL	NEPOOL_7_CT	7026	4,447	3,920	609	1,685	43.97	8.65	188	
MISO	CIN_3_MSA_TerreHaute_G	6410	3,230	1,015	818	2,188	35.55	8.58	186	

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
PJM	PL_8_MSA_Allentown_G	7935	2,853	385	514	1,484	44.34	9.78	181	71
SOUTHERN		8760	903	60	458	863	38.62	8.53	155	72
PJM	BGE_7_MSA_Baltimore-Towson_G	6273	2,548	1,043	500	1,248	46.86	11.07	147	73
PJM	PECO_1_MSA_Philadelphia_G	4106	2,323	554	754	1,138	47.27	9.67	146	74
SPP	KACP_4_MSA_KansasCity_G	7896	670	-	1,185	1,520	15.55	9.22	146	75
FRCC	NSB_1_MSA_DaytonaBeach_G	7640	514	86	427	513	43.91	9.93	143	76
	SOCO_2_GEN_Hartwll_G	2726	2,186	46	1,106	1,837	46.85	7.66	141	77
FRCC	LAK_1_MSA_Lakeland_G	8655	819	28	367	628	43.09	9.95	137	78
SPP	AEPW_9_MSA_MountPleasant_G	7212	8,168	3,832	554	1,937	34.00	6.38	136	79
SPP	CELE_10_MSA_Alexandria_G	8344	1,895	742	403	1,246	37.85	12.82	127	80
NEPOOL	NEPOOL_8_SWCT	6309	2,678	1,850	419	1,719	46.36	8.33	123	81
PJM	OVEC_3_G	3322	1,620	10	859	1,458	41.16	7.36	117	82
MISO	ALTE_2_MSA_Madison_G	8746	1,665	441	491	1,061	27.05	10.23	116	83
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	18.21	113	84
MAPP	MEC_3_MSA_DesMoines_G	8494	3,307	1,933	636	1,436	20.61	7.93	111	85
MISO	AMRN_12_MSA_StLouis_L	6285	5,059	6,066	625	1,758	27.33	6.16	107	86
MAPP	NPPD_4_GEN_Gentleman_G	8235	2,702	148	790	1,472	13.70	9.65	89	87
MISO	CILC_8_MSA_Peoria_G	8418	756	349	325	610	32.09	8.82	88	88
SPP	AEPW_5_MSA_Tulsa_G	7180	4,226	2,571	394	1,371	30.78	9.41	87	89
MISO	OTP_9_GEN_BigStone_G	8640	1,189	136	880	1,176	11.27	10.70	86	90
SPP	SPS_2_GEN_Tolk1_G	7024	4,480	2,973	198	696	57.81	18.06	80	91
PJM	VAP_26_MSA_DC_G	6654	1,981	631	240	476	45.75	10.60	73	92
SPP	GRDA_2_G	7507	849	179	303	652	31.85	9.69	72	93
MISO	EEI_2_MSA_Paducah_G	8486	507	36	281	473	30.10	9.28	72	94
FRCC	GVL_3_MSA_Gainesville_G	7584	433	15	208	373	43.09	9.95	68	95
MISO	MIPU_7_MSA_KansasCity_G	5729	1,307	437	329	779	35.90	11.43	68	96
FRCC	TAL_3_MSA_Tallahassee_G	8139	336	-	197	262	42.23	9.62	68	97
FRCC	KIS_10_MSA_Orlando_G	7037	410	-	209	358	44.67	9.78	66	98
FRCC	LWU_1_MSA_Miami_G	7060	250	82	202	249	45.47	10.89	65	99
MISO	DPC_10_G	6898	615	140	292	500	29.54	12.99	59	100
VACAR	CPLW_3_Asheville_G	6178	764	93	220	634	39.81	9.54	54	101
TVAUTHOR	TVA_9_MSA_Paducah_G	6585	4,470	2,130	209	1,104	35.98	9.26	50	102
SPP	KACY_10_MSA_KansasCity_G	8032	316	40	171	234	34.64	14.15	48	103
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43	6.58	43	104
MAPP	WAPA_2_MSA_RapidCity_G	3167	2,405	813	582	870	20.98	6.27	39	105

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2011R2

										Rank
			Gen	Load	Avg net	Max Net		Price	Revenue	based on
		Source	Weight	Weight	injection	injection	Price	Std.Dev	Surplus	Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	EES_7_MSA_Beaumont-PortArthur_G	2674	7,393	4,949	326	1,504	39.85	6.29	35	
MISO	ALTW_6_MSA_CedarRapids_L	7395	996	1,103	163	386	25.29	7.43		
MISO	XEL_3_MSA_Minneapolis_G	2949	7,596	7,622	585	1,604	17.49	5.27	30	
SPP	SWPA_2_MSA_MountainHome_G	5782	478	70	320	450	15.99	16.28		
	IESO_2_G	2022	2,437	2,116	295	1,032	42.49	5.18		110
MAPP	MPW_1_MSA_Muscatine_G	6967	151	16	123	142	27.16	8.65	23	
SPP	WERE_4_GEN_Wolfcreek_G	4315	3,510	2,459	231	872	23.22	13.00	23	
NEPOOL	NEPOOL_10_RI	2027	2,062	2,203	245	662	45.34	6.56	23	113
MISO	SIPC_9_MSA_Marion-Herrin_G	4348	432	37	127	360	37.57	9.85	21	114
NEPOOL	NEPOOL_1_VT	4760	821	1,115	104	397	40.76	7.65	20	
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	7.28	20	116
SPP	EMDE_1_MSA_Joplin_G	1665	1,102	458	246	661	41.75	9.78	17	117
SPP	LAFA_7_MSA_Lafayette_G	3186	175	-	92	175	57.40	27.00	17	118
MISO	WEC_3_MSA_Milwaukee_G	5326	1,429	2,423	147	461	20.37	8.20	16	119
MISO	CIN_4_MSA_Cincinnati-Middletown_G	2053	6,026	5,727	203	737	33.21	7.27	14	120
NYPP	NYISO_7_NYG	569	3,156	2,195	430	1,017	56.55	7.74	14	121
PJM	METED_4_MSA_Reading_G	2010	913	854	122	344	47.28	6.50	12	122
SPP	INDN_6_MSA_KansasCity_G	8700	143	27	36	127	32.81	12.39	10	123
SOUTHERN	SOCO_17_MSA_Mobile_G	840	5,205	4,575	243	955	48.88	7.76	10	124
MISO	SUNC_3_MSA_GardenCity_G	1350	840	18	103	198	53.99	15.20	8	125
MISO	METC_8_MSA_BayCity_G	747	3,795	2,562	206	1,115	42.54	11.89	7	126
PJM	AEP_3_MSA_Columbus_L	485	10,204	8,244	274	1,131	44.14	7.53	6	127
VACAR	DUK_4_MSA_Greenville_L	996	3,546	4,489	159	606	36.12	7.31	6	128
SPP	SPRM_10_MSA_Springfield_L	4284	236	346	39	131	31.54	7.10	5	129
PJM	PECO_5_MSA_Philadelphia_L	1496	1,656	2,510	104	276	33.27	7.19	5	130
FRCC	FMP_8_MSA_Sebastian_G	2398	145	20	37	43	57.28	4.84	5	131
SPP	AEPW_1_MSA_Tulsa_G	615	3,295	2,000	166	660	31.38	11.87	3	132
NEPOOL	NEPOOL_6_WCMA	204	4,285	3,417	266	1,256	50.74	7.09	3	133
TVAUTHOR	BCA_1_GEN_NRGBatesville_G	1001	87	14	56	70	47.89	5.67	3	134
SOUTHERN	SOCO 10 MSA Albany-Valdosta L	638	3,431	4,125	118	327	27.13	3.38	2	135
	SOCO_21_MSA_Atlanta_G	129	3,334	2,733	240	634	55.32	5.38	2	
	FE_5_MSA_Cleveland_L	405	3,216	4,680	103	435	30.51	5.36	1	137
MISO	SMMPA 9 MSA Rochester G	242	128	58	74	89	63.45	12.49	1	138
MISO	CWLP 1 MSA Springfield G	671	310	227	34	69	41.94	4.30	1	139
MISO	FE_7_MSA_Toledo_L	95	2,586	2,106	172	493	52.51	11.14	1	140

Task 2: Appendix 3, Simulation Results for Source Nodes (Hubs) LowCase2011R2

		Source	Gen Weight	Load Weight	Avg net injection	Max Net injection	Price	Price Std.Dev	Revenue Surplus	Rank based on Revenue
Market Area	Hub Name	Hrs	(MW)	(MW)	(MW)	(MW)	(\$/MWh)	(MWh)	(\$million)	Surplus
	OMPA_9_MSA_PoncaCity_G	536		147	19	75			1	141
	WEPL_7_MSA_DodgeCity_G	307	137	124		63			1	142
	FTP_7_MSA_PortStLucie_G	257	93	-	35	37	66.87	9.73	1	143
	DERS_1_MSA_Ruston_G	457	75	68	20	39	58.46	9.07	1	144
	FPL_2_MSA_FortMyers_G	80	5,929	4,563	142	623	41.97	4.77	0	
MISO	LGEE_9_MSA_Louisville_G	302	1,136	1,763	54	178	22.57	6.54	0	
	TVA_5_MSA_Nashville_L	71	9,154	8,858	146	529	28.90	3.06	0	
	ITC_2_MSA_Detroit_L	144	4,001	5,247	71	302	27.26	4.15	0	
	DP&L_6_MSA_Seaford_L	99	1,438	1,523	68	178	40.97	6.52	0	
	NEPOOL_4_NEBOS	43	3,262	5,904	154	490	37.23	1.05	0	
	WEC_7_MSA_Milwaukee_G	226	3,850	3,052	61	261	14.94	12.20	0	
	TVA_7_MSA_Memphis_L	46	7,215	5,982	86	379	33.86	5.70	0	. 0 =
	OKGE_4_MSA_OklahomaCity_L	41	2,102	2,403	58	139	56.35	7.36	0	
	DOE_2_MSA_Paducah_G	6	520	309	311	448	56.86	0.00	0	
	MGE_7_MSA_Madison_L	62	399	403	15	67	43.76	6.77	0	
	SCEG_9_MSA_Charleston_G	24	1,152	1,944	36	92	34.67	3.13	0	
NYPP	NYISO_5_NYE	5	1,098	909	95	167	39.92	6.03	0	
	PSEG_8_MSA_NewYork_G	2	3,860	3,654	47	72	38.67	10.55	0	
MISO	UPPC_9_MSA_Houghton_L	7	2	75	2	3	143.71	19.56	0	
NYPP	NYISO_9_NYI	472	2	1,476	0	2	34.64	6.62	0	160

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub Ir	nformation								Sink Hub Info	rmation								Congestion I	Indicators	
					Average									Average						
		0	0	Local	net	Max net	Average	Revenue			0'-1-	0	1	net	Max net	Average	Revenue	D		
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	
	MEC_3_MSA_DesMoines_G	7991 8254	3,307 4,946	1,933 2,500	908 1,579	1,431 2,362	29.65 47.51			AMRN_12_MSA_StLouis_L NEPOOL_7_CT	2085 1143	5,059 4,447	6,066 3,920	-464 -296	-1,852 -1,008	56.60 73.88	-55 -25		3893 6958	44% 79%
ONTARIO	NYISO_1_NYA IESO 15 G	8382	1,964	3,375	1,098	2,362	44.34		NEPOOL NYPP	NYISO 11 NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1.104		6963	79%
ONTARIO	IESO 6 G	8784	2,146	147	1,844	2,034	44.36			NYISO 11 NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104		6963	79%
ONTARIO	IESO 7 G	8784	2,953	253	2,502	2,825	44.36			NYISO 11 NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104		6963	79%
ONTARIO	IESO 15 G	8382	1,964	3,375	1,098	2,054	44.34		NYPP	NYISO 10 NYJ	8784	10.283	11,493	-3,670	-5,413	68.19	-2,198		8784	100%
ONTARIO	IESO 6 G	8784	2,146	147	1.844	2,071	44.36			NYISO 10 NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2.198		8784	100%
ONTARIO	IESO 7 G	8784	2,953	253	2,502	2.825	44.36			NYISO 10 NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198		8784	100%
	NI 15 MSA Davenport G	8664	2,479	0	1,717	2,314	33.05			AMRN 12 MSA StLouis L	2085	5,059	6,066	-464	-1,852	56.60	-55		5202	59%
			,		,	,				OKGE_4_MSA_OklahomaCity					, , ,			<b> </b>		
SPP	WERE_1_MSA_Manhattan_G	8771	2,988	409	1,354	2,277	36.55	434	SPP	_L	8783	2,102	2,403	-809	-1,550	59.89	-426		8329	95%
MISO	OTP_9_GEN_BigStone_G	8784	1,189	136	738	1,097	20.83			XEL_3_MSA_Minneapolis_G	4672	7,596	7,622	-853	-2,783	43.84	-175		7840	89%
ONTARIO	IESO_15_G	8382	1,964	3,375	1,098	2,054	44.34			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445		6955	79%
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	44.36		NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445		6956	79%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	44.36			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445		6956	79%
	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51			NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104		6963	79%
	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290				AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	-55			66%
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51			NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198		8784	100%
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445		6868	78%
ONTARIO	IESO_15_G	8382	1,964	3,375	1,098	2,054	44.34	408	NYPP	NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	18.5	6952	79%
SPP	WERE 1 MSA Manhattan G	8771	2.988	409	1.354	2.277	36.55	434	SPP	WERE 4 GEN Wolfcreek G	3653	3.510	2.459	-485	-1.564	55.01	-97	18.5	3355	38%
ONTARIO	IESO 6 G	8784	2,146	147	1,844	2,071	44.36	718	NYPP	NYISO 7 NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	18.4	6952	79%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	44.36	975	NYPP	NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	18.4	6953	79%
										OKGE_4_MSA_OklahomaCity										
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85		SPP	_L	8783	2,102	2,403	-809	-1,550	59.89	-426		3996	45%
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394		VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	-118		6655	76%
	PENELEC_2_MSA_DuBois_G	8336	2,724	1,196	764	1,643	52.40			NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104		6963	79%
	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26			AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	-55		3670	42%
	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51			NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	-392		6972	79%
	NI_6_MSA_Chicago_G	8111	9,759	7,577	1,023	2,890	39.39			AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	-55		3677	42%
	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89			AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425		8036	91%
	NI_20_MSA_Chicago_G	7214	1,632	83	889	1,504	39.87		MISO	AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	-55		3664	42%
	NPPD_4_GEN_Gentleman_G	8760	2,702	148	635	1,479	13.97		MAPP	OPPD_5_MSA_Omaha_L	8784	480	1,686	-847	-1,521	30.69	-228		8367	95%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96	742	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	16.7	8019	91%
MISO	IP 8 GEN Clinton G	8016	2,302	1,195	916	1,230	40.02	294	MISO	AMRN_12_MSA_StLouis_L	2085	5,059	6,066	-464	-1,852	56.60	-55	16.6	1758	20%
MISO	FE_9_MSA_Weirton_G	8571	1,860	112	1,269	1,807	44.07	480	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	16.6	7993	91%
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51	619	NEPOOL	NEPOOL_6_WCMA	8643	4,285	3,417	-1,343	-3,453	63.68	-739	16.2	6958	79%
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51	619	NEPOOL	NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,898	63.65	-759	16.1	6958	79%
										AP_7_MSA_Hagerstown-								1		
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89	495	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	59.93	-348	16.0	8003	91%
										AP_7_MSA_Hagerstown-								1		
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96	742	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	59.93	-348	16.0	7988	91%
										AP_7_MSA_Hagerstown-										
MISO	FE_9_MSA_Weirton_G	8571	1,860	112	1,269	1,807	44.07		PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	59.93	-348		7957	91%
	PENELEC_2_MSA_DuBois_G	8336	2,724	1,196	764	1,643	52.40			NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198		6961	79%
	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394		AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425		8060	92%
	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51			NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337		6792	77%
	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65			NEPOOL_7_CT	1143	4,447 910	3,920	-296	-1,008	73.88	-25		8772	100%
PJM NYPP	AEP_8_GEN_Amos01_G	8783	19,694 4,946	6,544 2,500	6,016 1,579	10,177	45.31	2,394		VAP_33_MSA_DC_L	8784		2,983	-1,730	-2,599	60.40	-918		8132	93%
NYPP	NYISO_1_NYA	8254	4,946 4,946		.,	2,362 2,362	47.51 47.51			NEPOOL_10_RI	6570	2,062	2,203	-406 -1,122	-1,222	62.60 62.55	-167 -617		6958	79% 90%
MISO	NYISO_1_NYA	8254 8784	1,355	2,500 476	1,579 908	1,163	36.10		PJM MISO	PSEG_8_MSA_NewYork_G LGEE_5_MSA_Lexington_L	8784 8784	3,860 595	3,654 2,345	-1,122 -1.652	-2,398 -2,690	51.03	-617 -740		7874 7398	
PJM	BREC_3_County_Webster_G AEP 8 GEN Amos01 G	8783	19,694	6.544	6.016	10,177	45.31	2.394		VAP 27 MSA DC L	8784	095	1.048	-1,652	-2,690	60.24	-740		8033	84% 91%
MISO	IP 7 GEN Baldwin G	8784	1,900	444	1,189	1.478	41.69			AMRN 12 MSA StLouis L	2085	5.059	6.066	-464	-1,073	56.60	-555 -55		1093	12%
	NYISO 1 NYA	8254	4,946	2,500	1,109	2,362	47.51		PJM	PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-951	-1,856	62.39	-521		7901	90%
		3234	.,540	2,000	.,575	_,502		313		AP_7_MSA_Hagerstown-	5.04	.,040	2,270	301	.,500	52.55	321	. +.5		5570
PJM	AEP 8 GEN Amos01 G	8783	19,694	6,544	6,016	10,177	45.31	2,394	PJM	Martinsburg L	8784	203	1,153	-661	-1,009	59.93	-348	14.6	8032	91%
	PENELEC_2_MSA_DuBois_G	8336	2,724	1,196	764	1,643	52.40			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445		6925	79%
															,					1.270
NYPP	NYISO_1_NYA	8254	4,946	2,500	1,579	2,362	47.51	619	PJM	PSEG_5_MSA_Philadelphia_L	8784	2,143	2,766	-1,072	-2,213	61.65	-580	14.1	7916	90%
	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05	492	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638		6137	70%
		4112	7,596	7,622	820	2,043	19.05	64	MISO	GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,007	-1,827	32.63	-289	13.6	0	0%
MISO	XEL_3_MSA_Minneapolis_G																			
MISO	BREC_3_County_Webster_G	8784	1,355	476	908	1,163	36.10			TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655		7759	88%
MISO PJM							36.10 33.05 43.10	492	PJM	TVA_5_MSA_Nashville_L AEP_1_MSA_Lynchburg_G AMRN_12_MSA_StLouis_L	8541 8784 2085	9,154 843 5,059	8,858 2,162 6,066	-1,543 -1,537 -464	-2,299	49.67 46.54 56.60	-655 -628 -55	13.5	7759 6898 2429	88% 79% 28%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub In	nformation								Sink Hub Info	rmation								Congestion I	ndicators	$\overline{}$
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
			g	g	()	()	(4)	(4)		OKGE_4_MSA_OklahomaCity		g	g	()	()	(4)	(4)			
SPP	AEPW_9_MSA_MountPleasant_0	7676	8,168	3,832	715	1,919	46.57	255	SPP	_L	8783	2,102	2,403	-809	-1,550	59.89	-426	13.3	4668	53%
ENTERCY	FFC 2 MCA Between the C	8784	2.525	4 007	4.054	0.700	40.00	000	CDD	OKGE_4_MSA_OklahomaCity	0700	2 402	2 402	000	4.550	50.00	400	12.0	5940	C00/
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68	800	SPP	_L	8783	2,102	2,403	-809	-1,550	59.89	-426	13.2	5940	68%
ENTERGY	EES 9 MSA Russellville G	2533	6,123	4,517	196	1,152	41.85	21	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	13.1	6875	78%
MISO	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76			TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	12.9	5412	62%
PJM	NI_15_MSA_Davenport_G	8664 8616	2,479	0	1,717	2,314	33.05		PJM	NI_6_MSA_Chicago_G	673	9,759	7,577	-321 -464	-1,221	45.80	-10		4800	55%
IVAUIHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	MISO	AMRN_12_MSA_StLouis_L OKGE 4 MSA OklahomaCity	2085	5,059	6,066	-464	-1,852	56.60	-55	12.7	6024	69%
SPP	AEPW 5 MSA Tulsa G	7426	4,226	2,571	406	1,330	47.19	142	SPP	L	8783	2,102	2,403	-809	-1,550	59.89	-426	12.7	1435	16%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48			NEPOOL_7_CT	1143	4,447	3,920	-296	-1,008	73.88	-25		7452	85%
NYPP	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60	240	NEPOOL	NEPOOL_7_CT	1143	4,447	3,920	-296	-1,008	73.88	-25	12.3	8753	100%
ENTERGY	EES 9 MSA Russellville G	2533	6.123	4.517	196	1.152	41.85	24	SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	7519	3.431	4.125	-701	-2.899	54.12	-285	12.3	3642	41%
ENTERGY	AECI 4 GEN NewMadrid1 G	2533 8784	2,315	4,517 248	1,156	1,152	41.85		MISO	AMRN 12 MSA StLouis L	2085	5,059	6,066	-701 -464	-2,899 -1.852	56.60	-285 -55		3642 2888	33%
MISO	WEC 1 MSA Chicago G	8784	1,728	303	896	1,140	33.61		PJM	NI 6 MSA Chicago G	673	9,759	7,577	-321	-1,221	45.80	-10		4476	51%
						, -						- ,	,-		,					
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,140	33.61		MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-758	-1,367	45.73	-305	12.1	5709	65%
NEPOOL	NEPOOL_2_NH	8426 8783	4,204 19,694	2,621 6,544	1,020	1,855 10,177	61.82 45.31			NEPOOL_7_CT VAP 15 MSA VB-Norfolk L	1143 8784	4,447 435	3,920 1,297	-296 -572	-1,008 -1,149	73.88 57.34	-25 -288	12.1 12.0	7477	85%
PJM PJM	AEP_8_GEN_Amos01_G AP_1_County_Harrison_G	8783 8784	19,694 6,563	2,223	6,016 2,546	3,985	45.31 51.13	2,394 1,144		VAP_15_MSA_VB-Norfolk_L VAP 7 G	8784 1848	435 4,179	1,297	-5/2	-1,149 -1,772	63.09	-288 -118	12.0 12.0	8024 5642	91% 64%
. 5141	ounty_namoun_o	0704	0,000	۷,۷۷۵	2,040	3,303	31.13	1,144	. 5111	AEP 9 MSA Canton-	1040	4,179	303	1,012	1,112	33.08	-110	12.0	JU42	U+ /0
PJM	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05	492	PJM	Massillon_L	8784	733	2,120	-1,481	-2,058	44.99	-585	11.9	5384	61%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	34.96		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	11.7	6067	69%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	34.96		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	11.6	6603	75%
PJM PJM	PJM500_3_MSA_Pittsburgh_G AEP 8 GEN Amos01 G	8784 8783	1,705 19,694	6,544	1,364 6,016	1,700 10,177	51.51 45.31	2,394	PJM MISO	VAP_7_G AMRN 12 MSA StLouis L	1848 2085	4,179 5,059	303 6,066	-1,012 -464	-1,772 -1,852	63.09 56.60	-118 -55	11.6 11.3	6872 817	78% 9%
MISO	WEC 1 MSA Chicago G	8784	1.728	303	896	1,140	33.61		MISO	METC 8 MSA BavCity G	8326	3,795	2,562	-544	-1,852	44.80	-203	11.3	5867	67%
MAPP	MEC 3 MSA DesMoines G	7991	3,307	1,933	908	1,431	29.65		MISO	AMRN 2 County Macon L	8784	174	1,209	-717	-1,139	40.84	-257	11.2	5724	65%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65	934		NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104	11.1	8784	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51	760		FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	-1,344	11.0	5655	64%
SOUTHERN P.IM	SOCO_15_MSA_Birmingham_G PJM500 9 MSA Pittsburgh G	8671 8784	12,464 1,700	9,217	1,735 1,475	5,010 1,700	50.51 52.18	760	FRCC PJM	FPL_3_MSA_Miami_L VAP 7 G	8784 1848	6,944 4,179	7,089 303	-1,951 -1,012	-4,084 -1,772	61.44 63.09	-1,053 -118	10.9 10.9	5258 7094	60% 81%
	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,475	1,700	50.59		FRCC	FPL 7 MSA Miami L	8784	4,179 570	3,923	-1,012	-1,772	61.50	-1.344	10.9	7094 5651	64%
	SOCO 28 MSA Birmingham G	8616	2,535	1,090	1,369	1,917	50.59			FPL 3 MSA Miami L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	10.9	5257	60%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	34.96			NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,221	45.80	-10	10.8	4438	51%
	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67			FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	-1,344		5349	61%
SOUTHERN	SOCO_26_MSA_Macon_G SOCO 31 MSA Atlanta G	8784 8775	6,802 11,765	1.583	5,109 3,912	5,796 9.527	50.67 50.80		FRCC FRCC	FPL_3_MSA_Miami_L FPL 7 MSA Miami L	8784 8784	6,944 570	7,089 3,923	-1,951 -2,488	-4,084 -4,070	61.44 61.50	-1,053 -1,344	10.8 10.7	5361 5644	61% 64%
	SOCO_31_MSA_Atlanta_G SOCO 32 MSA Pascagoula G	7531	3,574	2,674	3,912	1,538	50.84		FRCC	FPL_7_MSA_MIAMI_L FPL 7 MSA MIAMI L	8784	570 570	3,923	-2,466	-4,070	61.50	-1,344	10.7	5894	67%
	SOCO 31 MSA Atlanta G	8775	11,765	1,583	3,912	9,527	50.80		FRCC	FPL 3 MSA Miami L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	10.6	5253	60%
												·								
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,156	1,641	44.39		SPP	WERE_4_GEN_Wolfcreek_G	3653	3,510	2,459	-485	-1,564	55.01	-97	10.6	7437	85%
SOUTHERN PJM	SOCO_32_MSA_Pascagoula_G PENELEC 2 MSA DuBois G	7531 8336	3,574 2,724	2,674 1,196	469 764	1,538 1,643	50.84 52.40		FRCC NYPP	FPL_3_MSA_Miami_L NYISO 7 NYG	8784 7979	6,944 3,156	7,089 2,195	-1,951 -673	-4,084 -1,446	61.44 62.81	-1,053 -337	10.6 10.4	5533 6924	63%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	604	1,043	35.42			NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,446	45.80	-337	10.4	5812	79% 66%
WIICO	7.ETE_2_WG/_WadGGH_G	0010	1,000	771	004	1,000	00.4£	104	1 0101	SOCO_10_MSA_Albany-	0/0	5,705	7,077	021	1,221	40.00	10	10.4	3012	0070
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	Valdosta_L	7519	3,431	4,125	-701	-2,899	54.12	-285	10.2	5564	63%
NEPOOL	NEPOOL_5_SEMA	8784	6,454	3,978	1,952	3,703	63.66			NEPOOL_7_CT	1143	4,447	3,920	-296	-1,008	73.88	-25		2246	26%
VACAR	CPLE_1_MSA_Durham_G	7843	10,224	8,563	1,031	2,817	52.97	428		VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	-118	10.1	5436	62%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	34.96	651	PJM	AEP_9_MSA_Canton- Massillon_L	8784	733	2,120	-1,481	-2,058	44.99	-585	10.0	5576	63%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	1,144		PEPCO_1_MSA_DC_L	8784	0	1,439	-847	-1,492	61.10	-455	10.0	7772	88%
MISO	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	9.9	6680	76%
										BGE_9_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0 000	1,364	1,700	51.51		PJM	Towson_L	8784	0	1,186	-681	-1,226	61.38	-367		8004 6903	91%
MISO PJM	AMRN_12_MSA_StLouis_L PJM500_3_MSA_Pittsburgh_G	6699 8784	5,059 1,705	6,066	757 1.364	1,937 1,700	36.76 51.51		PJM PJM	AEP_1_MSA_Lynchburg_G PEPCO 1 MSA DC L	8784 8784	843 0	2,162 1,439	-1,537 -847	-2,299 -1.492	46.54 61.10	-628 -455	9.8 9.6	7861	79% 89%
NYPP	NYISO 3 NYC	8784	6,711	2,657	1,813	3,003	58.65		NYPP	NYISO 10 NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198	9.5	8784	100%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	1,144		AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	9.5	7638	87%
	•									BGE_10_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,364	1,700	51.51		PJM	Towson_L	8784	845	1,565	-571	-1,411	60.97	-306		7970	91%
MISO MISO	LGEE_3_GEN_Gehnt2_G	8784 8765	2,000 2,892	225 1,694	1,486 940	1,894 1,665	41.68 37.31		MISO PJM	LGEE_5_MSA_Lexington_L AEP_2_STA_TN-WV_L	8784 8784	595 1,284	2,345 2,977	-1,652 -1,557	-2,690 -2,640	51.03 46.65	-740 -638	9.4 9.3	4258 1455	48% 17%
IVIIOU	NIPS_8_MSA_Chicago_G	0/05	2,092	1,094	940	1,005	31.31	307	ı JIVI	BGE_5_MSA_Baltimore-	0/04	1,264	2,917	-1,55/	-2,040	40.05	-038	9.3	1405	1770
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,364	1,700	51.51	617	PJM	Towson_L	8784	263	1,462	-750	-1,299	60.83	-401	9.3	7958	91%
	. ,		.,. 50		., '	.,. 50			-	· -		_50	.,	. 50	.,==0	,	.51			0.70

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub I	nformation								Sink Hub Info	rmation								Congestion I	ndicators	$\overline{}$
					Average			_						Average			_			
		Causas	C	Land	net	Max net	Average	Revenue			Sink	C	Lood	net	Max net	Average Price	Revenue	Deina		
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	(\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2.546	3.985	51.13	1,144		VAP 33 MSA DC L	8784	910	2.983	-1.730	-2,599	60.40	-918	9.3	7752	88%
MISO	NIPS 8 MSA Chicago G	8765	2,892	1.694	940	1,665	37.31		PJM	AEP 1 MSA Lynchburg G	8784	843	2,162	-1,537	-2,299	46.54	-628	9.2	4786	54%
			,	,		,				BGE_9_MSA_Baltimore-			, -	,	,					
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	52.18		PJM	Towson_L	8784	0	1,186	-681	-1,226	61.38	-367		7942	90%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,364	1,700	51.51		PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	9.1	7904	90%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	1,144		VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	60.24	-339	9.1	7607	87%
MISO PJM	AMRN_12_MSA_StLouis_L PJM500 3 MSA Pittsburgh G	6699 8784	5,059 1,705	6,066	757 1,364	1,937 1,700	36.76 51.51			NI_6_MSA_Chicago_G PL 7 MSA Allentown L	673 8784	9,759 245	7,577 1,051	-321 -643	-1,221 -1,025	45.80 60.45	-10 -341		5534 8698	63% 99%
PJIVI	PJW500_3_WSA_PIUSBUIGH_G	0/04	1,705	U	1,304	1,700	51.51	017	PJIVI	PL_7_WSA_Allentown_L	0/04	245	1,051	-643	-1,025	60.45	-341	0.9	0090	99%
ENTERGY	EES 9 MSA Russellville G	2533	6,123	4,517	196	1,152	41.85	21	SOUTHERN	SOCO 16 MSA Atlanta L	8784	694	3,058	-1,302	-2,646	50.79	-581	8.9	3558	41%
			-,,	.,		.,								.,					0000	,
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85	21	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	50.79	-475	8.9	3589	41%
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85	21	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	50.79	-816	8.9	3589	41%
																====				
ENTERGY PJM	EES_9_MSA_Russellville_G PJM500_9_MSA_Pittsburgh_G	2533 8784	6,123 1,700	4,517	196 1,475	1,152 1,700	41.85 52.18		PJM	SOCO_5_GEN_GEPCHY_L PEPCO_1_MSA_DC_L	8784 8784	2,098	3,403 1,439	-1,807 -847	-2,983 -1,492	50.78 61.10	-806 -455	8.9 8.9	3522 7842	40% 89%
PJM	PJM500_9_MSA_Pittsburgh_G PJM500_3_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	51.51		PJM	VAP 33 MSA DC L	8784	910	2,983	-1.730	-1,492	60.40	-455 -918		7842 8003	91%
1 JIVI	I JIVIJOO_3_IVIJA_I IKISDUIGII_G	0704	1,700	0	1,504	1,700	31.31	017	1 JIVI	VAI _35_INIOA_DC_L	0704	310	2,303	-1,730	-2,555	00.40	-310	0.5	0003	3170
ENTERGY	EES 9 MSA Russellville G	2533	6,123	4,517	196	1,152	41.85	21	SOUTHERN	SOCO 21 MSA Atlanta G	8765	3,334	2,733	-888	-1,940	50.72	-395	8.9	3499	40%
			-,							SOCO_6_MSA_Augusta-		-,	,		,					
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85	21	SOUTHERN	Richmond_L	8784	0	1,187	-657	-1,116	50.70	-293	8.8	2986	34%
										AP_7_MSA_Hagerstown-										1
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	1,144	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	59.93	-348	8.8	7615	87%
P.IM	DIMEGO O MOA Birelevent O	0704	4 700		4 475	4 700	50.40	070	D.114	BGE_10_MSA_Baltimore-	0704	845	4.505	574		00.07	000	0.0	7000	000/
. 0111	PJM500_9_MSA_Pittsburgh_G SOCO 15 MSA Birmingham G	8784 8671	1,700 12,464	9,217	1,475 1,735	1,700 5,010	52.18 50.51		PJM FRCC	Towson_L FPL 2 MSA FortMyers G	8784 8506	5.929	1,565 4,563	-571 -1.034	-1,411 -2,343	60.97 59.29	-306 -521	8.8 8.8	7898 4980	90% 57%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	9,217	1,735	1,700	51.51		PJM	VAP 27 MSA DC L	8784	5,929	1,048	-1,034	-2,343	60.24	-339	8.7	7774	89%
	SOCO_28_MSA_Birmingham_G		2,535	1,090	1,369	1,917	50.59			FPL_2_MSA_FortMyers_G	8506	5,929	4,563	-1,034	-2,343	59.29	-521	8.7	4976	57%
CCCTTLETUT	CCCC_LC_INO/ C_BIIIIIIIgiiaiii_C	0010	2,000	1,000	1,000	1,017	00.00	007		BGE 5 MSA Baltimore-	0000	0,020	1,000	1,001	2,010	00.20	UL.	0.7	1070	0.70
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	52.18	676	PJM	Towson_L	8784	263	1,462	-750	-1,299	60.83	-401	8.6	7887	90%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67	2,274	FRCC	FPL_2_MSA_FortMyers_G	8506	5,929	4,563	-1,034	-2,343	59.29	-521	8.6	5113	58%
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	65.27		NEPOOL	NEPOOL_7_CT	1143	4,447	3,920	-296	-1,008	73.88	-25		8751	100%
MISO	NIPS_8_MSA_Chicago_G	8765	2,892	1,694	940	1,665	37.31		PJM	NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,221	45.80	-10		17	0%
	SOCO_31_MSA_Atlanta_G	8775	11,765	1,583	3,912	9,527	50.80		FRCC	FPL_2_MSA_FortMyers_G	8506	5,929	4,563	-1,034 -798	-2,343	59.29	-521	8.5	4975	57%
PJM	PJM500_9_MSA_Pittsburgh_G SOCO_32_MSA_Pascagoula_G	8784 7531	1,700 3,574	2,674	1,475 469	1,700 1,538	52.18 50.84		PJM FRCC	AP_8_MSA_DC-VA-MD_L FPL_2_MSA_FortMyers_G	8784 8506	5,929	1,097 4,563	-1,034	-1,144 -2,343	60.64 59.29	-425 -521	8.5 8.4	7965 5282	91% 60%
SOUTHERN	30CO_32_W3A_Fascagoula_G	7551	3,374	2,074	409	1,330	30.04	179		AP_7_MSA_Hagerstown-	0000	5,929	4,503	-1,034	-2,343	39.29	-521	0.4	3202	00%
PJM	PJM500 3 MSA Pittsburgh G	8784	1,705	0	1,364	1,700	51.51	617	PJM	Martinsburg L	8784	203	1,153	-661	-1,009	59.93	-348	8.4	7890	90%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	604	1,083	35.42		MISO	XEL_3_MSA_Minneapolis_G	4672	7,596	7,622	-853	-2,783	43.84	-175	8.4	2320	26%
																				i 1
SPP	AEPW_9_MSA_MountPleasant_0	7676	8,168	3,832	715	1,919	46.57			EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	8.3	8744	100%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	52.18		PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-643	-1,025	60.45	-341	8.3	8453	96%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48	/1	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104	8.3	8784	100%
MISO	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76	186	PJM	AEP_9_MSA_Canton- Massillon_L	8784	733	2,120	-1,481	-2,058	44.99	-585	8.2	6085	69%
NYPP	NYISO 3 NYC	8784	6.711	2,657	1.813	3.003	58.65			NYISO 9 NYI	8467	2	1,476	-786	-1.993	66.87	-445	8.2	8687	99%
PJM	PJM500 9 MSA Pittsburgh G	8784	1,700	2,307	1,475	1,700	52.18		PJM	VAP 33 MSA DC L	8784	910	2,983	-1,730	-2,599	60.40	-918	8.2	8090	92%
NYPP	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60		NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104	8.1	8784	100%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	52.18		PJM	VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	60.24	-339	8.1	7782	89%
PJM	PENELEC_2_MSA_DuBois_G	8336	2,724	1,196	764	1,643	52.40	334	PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-643	-1,025	60.45	-341	8.1	7495	85%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,486	1,894	41.68	544		TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	8.0	6261	71%
	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51		FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335 -2,670	58.48	-756 1 104	8.0	4752	54%
NEPOOL	NEPOOL_2_NH SOCO_28_MSA_Birmingham_G	8426 8616	4,204 2,535	2,621 1.090	1,020 1,369	1,855 1,917	61.82 50.59			NYISO_11_NYK FPC 4 MSA Tampa L	8784 8784	5,681 2,239	5,289 2,873	-1,802 -1,471	-2,670 -2,335	69.74 58.48	-1,104 -756	7.9 7.9	8784 4753	100% 54%
SOUTHLINK	5555_25_MG/CDIIIIIIIIIIIIIIII	0010	2,000	1,030	1,509	1,317	50.58	331		o_=_work_rampa_L	0704	۷,۷39	2,013	1,471	2,000	30.40	-130	7.9	4133	J+ /0
SPP	AEPW_5_MSA_Tulsa_G	7426	4,226	2,571	406	1,330	47.19	142	SPP	WERE_4_GEN_Wolfcreek_G	3653	3,510	2,459	-485	-1,564	55.01	-97	7.8	4472	51%
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85			TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	7.8	6094	69%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67	2,274	FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335	58.48	-756	7.8	4895	56%
																				,
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85			SOCO_17_MSA_Mobile_G	6709	5,205	4,575	-434	-1,703	49.65	-145	7.8	3475	40%
PJM	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05	492	MISO	AMRN_2_County_Macon_L AP 7 MSA Hagerstown-	8784	174	1,209	-717	-1,139	40.84	-257	7.8	5804	66%
PJM	PJM500 9 MSA Pittsburgh G	8784	1,700	0	1,475	1,700	52.18	676	PJM	Martinsburg L	8784	203	1,153	-661	-1,009	59.93	-348	7.8	7949	90%
	. soo_o_mo/\_i ittabuigil_G	0704	1,700		1,473	1,700	52.10	5,0	. 5		0704	200	1,100	551	1,003	30.33	040	7.0	1343	30 /0
PJM	PJM500_7_MSA_York-Hanover_	8784	2,696	0	2,195	2,570	60.81	1,172	PJM	PECO_5_MSA_Philadelphia_L	6653	1,656	2,510	-406	-2,442	68.54	-185	7.7	3177	36%
			,		, ,	,. •						,	, , ,				,,,			

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub I	nformation								Sink Hub Info	rmation								Congestion Ir	ndicators	
					Average			_						Average			_			
		Source	Gen	Load	net	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue	Price		
Market Area	Hub Name	Hours	Weight	Weight	injection (MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential I	I90 Hours	U90 %
markot / iroa	Trab Traino	110010	rroigin	rroigin	()	()	(φ,)	(\$11111)	markotytroa	Tido Tidino	110010	rroigin	vvoignt	(11111)	(11117)	(φ/)	(\$11111)	Billororida	300110010	000 70
SPP	AEPW_5_MSA_Tulsa_G	7426	4,226	2,571	406	1,330	47.19	142	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	7.7	7726	88%
						4 00=				AEP_9_MSA_Canton-		=								
MISO NYPP	NIPS_8_MSA_Chicago_G NYISO 1 NYA	8765 8254	2,892 4,946	1,694 2,500	940 1,579	1,665 2,362	37.31 47.51	307	PJM NEPOOL	Massillon_L NEPOOL 3 ME	8784 4861	733 3,494	2,120 2,522	-1,481 -227	-2,058 -1,154	44.99 55.19	-585	7.7 7.7	1501 7038	17% 80%
SOUTHERN	SOCO 31 MSA Atlanta G	8775	11.765	1,583	3,912	9,527	50.80		FRCC	FPC 4 MSA Tampa L	8784	2,239	2,522	-1,471	-1,154	58.48	-61 -756	7.7	4754	54%
SOUTHERN		7531	3,574	2,674	469	1,538	50.84		FRCC	FPC 4 MSA Tampa L	8784	2,239	2,873	-1,471	-2,335	58.48	-756	7.6	5102	58%
VACAR	CPLE_1_MSA_Durham_G	7843	10,224	8,563	1,031	2,817	52.97		PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,730	-2,599	60.40	-918	7.4	7574	86%
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26	1,205	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	7.4	2494	28%
ENTEROY	EEO O MOA Dooralladha O	0500	0.400	4547	400	4.450	44.05	21	ENTEROY	EES_7_MSA_Beaumont-	0700	7.000	4.949	-473	-1,685	40.45	457	7.0	0040	750/
ENTERGY PJM	EES_9_MSA_Russellville_G NI_2_MSA_Chicago_G	2533 8784	6,123 5,342	4,517 1,283	196 3,494	1,152 4,092	41.85 39.26	1,205	ENTERGY P IM	PortArthur_G AEP 1 MSA Lynchburg G	6739 8784	7,393 843	2,162	-4/3	-1,685	49.15 46.54	-157 -628	7.3 7.3	6610 5502	75% 63%
VACAR	CPLE 1 MSA Durham G	7843	10,224	8,563	1,031	2,817	52.97		PJM	VAP 27 MSA DC L	8784	040	1,048	-641	-1,075	60.24	-339	7.3	7253	83%
PJM	NI_6_MSA_Chicago_G	8111	9,759	7,577	1,023	2,890	39.39		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	7.3	2497	28%
	_																			
PJM	PJM500_4_MSA_Philadelphia_G	8374	2,383	0	1,338	2,295	61.29		PJM	PECO_5_MSA_Philadelphia_L	6653	1,656	2,510	-406	-2,442	68.54	-185	7.3	0	0%
PJM TVAUTHOR	NI_6_MSA_Chicago_G TVA 4 MSA Clarksville G	8111 8616	9,759 2,544	7,577 150	1,023 2.096	2,890 2,473	39.39 43.88		PJM MISO	AEP_1_MSA_Lynchburg_G LGEE 5 MSA Lexington L	8784 8784	843 595	2,162 2,345	-1,537 -1,652	-2,299 -2,690	46.54 51.03	-628 -740	7.2 7.1	5513 5276	63% 60%
ENTERGY	EES 9 MSA Russellville G	2533	6,123	4,517	196	1,152	41.85			EES 1 MSA Jackson L	8784	3,218	3,066	-1,032	-1.983	48.92	-740	7.1	2779	32%
LITTLE TO	EEG_G_MG/C_RAGGGMVIIIG_G	2000	0,120	1,017		1,102	11.00		LITTE CO.		0.0.	0,210	0,000	1,227	1,000	10.02	OL.		2,,,,	- 0270
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,302	-2,646	50.79	-581	6.9	5481	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	50.79	-475	6.9	5494	63%
TVALITHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	703	SOLITHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	50.79	-816	6.9	5486	62%
TVACTITOR	TVA_4_WIGA_CIAIRSVIIIe_G	0010	2,544	130	2,030	2,475	45.00	133	SOUTHERN	3000_33_W3A_Atlanta_L	0704	3	3,303	-1,020	-3,110	30.73	-010	0.5	3400	02 /6
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,807	-2,983	50.78	-806	6.9	5425	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	SOCO_21_MSA_Atlanta_G	8765	3,334	2,733	-888	-1,940	50.72	-395	6.8	5467	62%
TVAUTHOR	TVA 4 MSA Clarksville G	8616	2.544	150	2.096	2,473	43.88	703	SOUTHERN	SOCO_6_MSA_Augusta- Richmond L	8784	0	1.187	-657	-1.116	50.70	-293	6.8	5433	62%
PJM	NI 20 MSA Chicago G	7214	1,632	83	889	1,504	39.87		PJM	AEP 2 STA TN-WV L	8784	1.284	2,977	-1.557	-2.640	46.65	-638	6.8	4506	51%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48	71	NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198	6.7	8784	100%
NEPOOL	NEPOOL_7_CT	7641	4,447	3,920	689	1,728	63.04		NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104	6.7	8784	100%
PJM	NI_20_MSA_Chicago_G	7214	1,632	83	889	1,504	39.87		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	6.7	5421	62%
MISO	AMRN_12_MSA_StLouis_L SOCO 15 MSA Birmingham G	6699 8671	5,059 12,464	6,066 9,217	757 1,735	1,937 5,010	36.76 50.51		MISO FRCC	CIN_1_MSA_Indianapolis_L FPC 3 MSA Orlando L	8784 8784	816 1,232	4,274 3,649	-2,181 -1,856	-3,310 -3,553	43.40 57.11	-831 -931	6.6 6.6	6063 4237	69% 48%
NYPP	NYISO 6 NYF	7469	4,103	1,983	522	1,558	61.60		NYPP	NYISO 10 NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198	6.6	8784	100%
			,	,		,						.,	,	.,			,			
PJM	BGE_7_MSA_Baltimore-Towson_	7994	2,548	1,043	621	1,392	61.96		PJM	PECO_5_MSA_Philadelphia_L	6653	1,656	2,510	-406	-2,442	68.54	-185	6.6	4408	50%
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26	1,205		NI_6_MSA_Chicago_G	673		7,577	-321	-1,221	45.80	-10	6.5	0	0%
PJM	SOCO_28_MSA_Birmingham_G NI_15_MSA_Davenport_G	8616 8664	2,535 2,479	1,090	1,369 1,717	1,917 2,314	50.59 33.05		FRCC PJM	FPC_3_MSA_Orlando_L NI_13_MSA_Chicago_L	8784 8784	1,232 2,396	3,649 10,556	-1,856 -5,366	-3,553 -9,115	57.11 39.56	-931 -1,865	6.5 6.5	4237 4821	48% 55%
PJM	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05		PJM	NI_3_MSA_Chicago_L	8784	2,390	1,205	-634	-1,254	39.52	-1,803	6.5	4816	55%
	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67		FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,856	-3,553	57.11	-931	6.4	4390	50%
NEPOOL	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82		NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198	6.4	8784	100%
	SOCO_31_MSA_Atlanta_G	8775	11,765	1,583	3,912	9,527	50.80		FRCC	FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,856	-3,553	57.11	-931	6.3	4234	48%
MISO	SOCO_32_MSA_Pascagoula_G LGEE 3 GEN Gehnt2 G	7531 8784	3,574 2,000	2,674 225	469 1,486	1,538 1,894	50.84 41.68	179 544	FRCC TVAUTHOR	FPC_3_MSA_Orlando_L TVA 3 MSA Knoxville L	8784 8784	1,232 3,684	3,649 5,102	-1,856 -1,209	-3,553 -2,885	57.11 47.93	-931 -509	6.3 6.2	4736 5104	54% 58%
MISO	LGEE_3_GEN_Gennt2_G LGEE 3 GEN Gehnt2 G	8784	2,000	225	1,486	1,894	41.68	544		TVA_3_MSA_KNOXVIIIe_L TVA 7 MSA Memphis L	8773	7,215	5,102	-1,502	-4,034	47.93	-631	6.2	5104	60%
MISO	BREC_3_County_Webster_G	8784	1,355	476	908	1,163	36.10	288		LGEE_9_MSA_Louisville_G	8784	1,136	1,763	-957	-1,746	42.33	-356	6.2	7329	83%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,546	3,985	51.13	1,144		VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	-288	6.2	7695	88%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65		NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	-392	6.1	8774	100%
MISO NEPOOL	NIPS_8_MSA_Chicago_G NEPOOL_5_SEMA	8765 8784	2,892 6,454	1,694 3,978	940 1,952	1,665 3,703	37.31 63.66		MISO NYPP	CIN_1_MSA_Indianapolis_L NYISO 11 NYK	8784 8784	816 5,681	4,274 5,289	-2,181 -1.802	-3,310 -2,670	43.40 69.74	-831 -1,104	6.1 6.1	1355 8784	15% 100%
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	1,952	1,152	41.85			TVA 3 MSA Knoxville L	8784	3,684	5,269	-1,802	-2,885	47.93	-1,104	6.1	3521	40%
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85			TVA_7_MSA_Memphis_L	8773	7,215	5,982	-1,502	-4,034	47.91	-631	6.1	1009	11%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,140	33.61	264	PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	-1,865	6.0	4476	51%
PJM	NI_20_MSA_Chicago_G	7214	1,632	83		1,504	39.87		PJM	NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,221	45.80	-10	5.9	0	0%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,140	33.61	264	PJM	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	39.52	-220	5.9	4476	51%
ENTERGY	EES 9 MSA Russellville G	2533	6.123	4.517	196	1.152	41.85	21	SOUTHERN	SOCO_32_MSA_Pascagoula_	1253	3,574	2.674	-240	-1.091	47.76	-14	5.9	3262	37%
PJM	NI 7 MSA Rochelle G	8784	2,290	0	2,119	2,290	34.96		MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	40.84	-257	5.9	5721	65%
MISO	EKPC_8_MSA_Maysville_G	8784	1,396	272	936	1,366	45.18		MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,652	-2,690	51.03	-740	5.9	1237	14%
	550 4 1101 5 -									=======================================										
ENTERGY	EES_8_MSA_BatonRouge_G	8520	1,060	0	1,059	1,060	49.06			EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	5.8	5099	58%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,364	1,700	51.51	617	PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	-288	5.8	7850	89%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion I	ndicators	
					Average			_						Average			_	Ĭ		
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)		U90 Hours	U90 %
MISO	CIN_3_MSA_TerreHaute_G	7034	3,230	1,015	726	2,206	45.20			LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,652	-2,690	51.03	-740	5.8	129	1%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793		TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	5.8	5984	68%
MISO	IP_8_GEN_Clinton_G	8016	2,302	1,195	916	1,230	40.02	294	PJM	NI_6_MSA_Chicago_G	673	9,759	7,577	-321	-1,221	45.80	-10	5.8	161	2%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	SOCO_17_MSA_Mobile_G	6709	5,205	4,575	-434	-1,703	49.65	-145	5.8	5844	67%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8784	2,199	163	1,343	1,701	49.16	580	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	5.7	6322	72%
										AEP_9_MSA_Canton-										
PJM PJM	NI_2_MSA_Chicago_G	8784 8783	5,342 19.694	1,283 6,544	3,494 6,016	4,092 10,177	39.26 45.31	1,205 2,394	PJM	Massillon_L LGEE 5 MSA Lexington L	8784 8784	733 595	2,120 2,345	-1,481 -1,652	-2,058 -2,690	44.99 51.03	-585 -740	5.7 5.7	2535	29%
	AEP_8_GEN_Amos01_G TVA_4_MSA_Clarksville_G	8616	2,544	150	2.096	2,473	43.88	,		EES 9 MSA Russellville G	6251	6,123	4,517	-1,052	-1,630	49.53	-740	5.7	18 5867	0% 67%
TVACTION	TV/C4_IND/COLINGVIIIC_C	0010	2,044	100	2,000	2,470	40.00	730		AEP 9 MSA Canton-	0201	0,120	4,017		1,000	40.00	101	0.0	3007	01 70
PJM	NI_6_MSA_Chicago_G	8111	9,759	7,577	1,023	2,890	39.39	327		Massillon_L	8784	733	2,120	-1,481	-2,058	44.99	-585	5.6	2541	29%
										SOCO_10_MSA_Albany-										
TVAUTHOR SPP	TVA_1_MSA_Chatt-Hunts_G WERE 1 MSA Manhattan G	8782 8771	17,334 2,988	9,966 409	3,221 1,354	6,196 2,277	48.57 36.55	1,374 434		Valdosta_L AEPW 1 MSA Tulsa G	7519 7434	3,431 3,295	4,125 2,000	-701 -603	-2,899 -1,182	54.12 42.10	-285 -189	5.6 5.5	282 8634	3% 98%
SFF	WERE_I_WISA_Warmattan_G	0//1	2,900	409	1,334	2,211	30.33	434	SFF	AEPW_1_WSA_Tulsa_G AEPW 9 MSA MountPleasan	7434	3,293	2,000	-003	-1,102	42.10	-109	5.5	0034	9076
ENTERGY	EES_9_MSA_Russellville_G	2533	6,123	4,517	196	1,152	41.85	21	SPP	t_G	1108	8,168	3,832	-303	-1,116	47.31	-16	5.5	3749	43%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445	5.4	8737	99%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,156	1,641	44.39	451		TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	5.3	4893	56%
NYPP PJM	NYISO_6_NYF AEP 8 GEN Amos01 G	7469 8783	4,103 19,694	1,983 6,544	522 6,016	1,558 10,177	61.60 45.31	240		NYISO_9_NYI DUK 4 MSA Greenville L	8467 6816	3,546	1,476 4,489	-786 -587	-1,993 -2,021	66.87 50.52	-445 -202	5.3 5.2	8626 5209	98% 59%
FJIVI	AEF_6_GEN_AIII0S01_G	0/03	19,094	0,344	0,010	10,177	40.31	2,394	VACAR	DUK_4_WSA_Greenville_L	0010	3,340	4,409	-307	-2,021	30.32	-202	5.2	5209	3976
ENTERGY	EES 10 MSA Vicksburg G	8088	3,544	1,249	871	1,221	49.71	350	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	5.2	6331	72%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,475	1,700	52.18	676	PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	-288	5.2	7922	90%
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394		DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,115	-3,574	50.47	-937	5.2	3560	41%
NEPOOL ENTERGY	NEPOOL_7_CT	7641	4,447	3,920	689	1,728 1,641	63.04 44.39			NYISO_10_NYJ EES 9 MSA Russellville G	8784 6251	10,283	11,493 4,517	-3,670 -444	-5,413 -1,630	68.19 49.53	-2,198 -137	5.1 5.1	8777	100%
ENTERGT	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,156	1,041	44.39	451		AEP_9_MSA_Canton-	6251	6,123	4,517	-444	-1,630	49.53	-137	5.1	4674	53%
РЈМ	NI 20 MSA Chicago G	7214	1,632	83	889	1,504	39.87	256		Massillon L	8784	733	2,120	-1.481	-2,058	44.99	-585	5.1	2532	29%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,409	6,440	57.98	1,736		VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	-118	5.1	5456	62%
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	0	1,232	1,330	56.40			FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	-1,344	5.1	4748	54%
NEPOOL	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82			NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445	5.1	8771	100%
FRCC NYPP	SEC_6_MSA_Palatka_G NYISO 3 NYC	8160 8784	1,330 6,711	2,657	1,232 1,813	1,330 3,003	56.40 58.65	567 934		FPL_3_MSA_Miami_L NEPOOL 6 WCMA	8784 8643	6,944 4,285	7,089 3,417	-1,951 -1,343	-4,084 -3,453	61.44 63.68	-1,053 -739	5.0 5.0	4762 8396	54% 96%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65			NEPOOL_6_WCMA	8691	3,262	5,904	-1,343	-3,898	63.65	-759	5.0	8770	100%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,486	1,894	41.68			AEP 2 STA TN-WV L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	5.0	4295	49%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89			FE_5_MSA_Cleveland_L	6473	3,216	4,680	-517	-2,089	48.67	-163	4.8	4458	51%
	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96			FE_5_MSA_Cleveland_L	6473	3,216	4,680	-517	-2,089	48.67	-163	4.7	4391	50%
PJM	VAP_7_G	6936	4,179	303	1,656	3,629	56.01			AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	4.6	5365	61%
PJM MISO	NI_7_MSA_Rochelle_G FE_9_MSA_Weirton_G	8784 8571	2,290 1,860	112	2,119 1,269	2,290 1,807	34.96 44.07	651		NI_13_MSA_Chicago_L FE_5_MSA_Cleveland_L	8784 6473	2,396 3,216	10,556 4,680	-5,366 -517	-9,115 -2,089	39.56 48.67	-1,865 -163	4.6 4.6	4373 3653	50% 42%
	NI_7_MSA_Rochelle_G	8784	2.290	0	2,119	2,290	34.96			NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	39.52	-220	4.6	4410	50%
	NEPOOL 5 SEMA	8784	6,454	3,978	1,952	3,703	63.66	1,092		NYISO_10_NYJ	8784	10,283	11,493	-3,670	-5,413	68.19	-2,198	4.5	8778	100%
MISO	EKPC_8_MSA_Maysville_G	8784	1,396	272	936	1,366	45.18	372		TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	4.5	5678	65%
PJM	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05			WEC_3_MSA_Milwaukee_G	6898	1,429	2,423	-264	-1,143	37.53	-68	4.5	4142	47%
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	65.27	906		NYISO_11_NYK	8784	5,681	5,289	-1,802	-2,670	69.74	-1,104	4.5	8784	100%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	871	1,221	49.71	350	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7519	3,431	4,125	-701	-2,899	54.12	-285	4.4	1389	16%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51	760	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	4.4	6980	79%
PJM	VAP_7_G	6936	4,179	303	1,656	3,629	56.01	643		VAP_33_MSA_DC_L	8784	910	2,983	-1,730	-2,599	60.40	-918	4.4	5395	61%
VACAR	CPLE_1_MSA_Durham_G	7843	10,224	8,563	1,031	2,817	52.97	428		VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	-288	4.4	6487	74%
PJM FRCC	AEP_8_GEN_Amos01_G JEA 6 MSA Jacksonville G	8783 8784	19,694 1.665	6,544 358	6,016 908	10,177 1.345	45.31 57.15			TVA_5_MSA_Nashville_L FPL 7 MSA Miami L	8541 8784	9,154 570	8,858 3,923	-1,543 -2,488	-4,313 -4.070	49.67 61.50	-655 -1.344	4.4 4.4	6030 4272	69% 49%
PROC	JEN_O_IVION_JACKSONVIIIE_G	0/04	1,005	338	908	1,345	37.15	406	i NOC	I I L_/_IVIOA_IVIIAITII_L	0/04	5/0	3,923	-2,408	-4,070	01.50	-1,344	4.4	4212	49%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,369	1,917	50.59	597	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	4.3	6936	79%
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	908	1,345	57.15	456	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	4.3	4282	49%
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,421	1,584	57.25	714	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	-1,344	4.3	5129	58%
SOUTHERN	SOCO 26 MSA Macon G	8784	6,802	0	5,109	5,796	50.67	2,274	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	4.2	7077	81%
PJM	VAP 7 G	6936	4,179	303		3,629	56.01	643		VAP 27 MSA DC L	8784	0,733	1,048	-641	-1,075	60.24	-339	4.2	5395	61%
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,421	1,584	57.25			FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	4.2	5135	58%
MISO	NIPS_8_MSA_Chicago_G	8765	2,892	1,694	940	1,665	37.31			CIN_7_MSA_Lafayette_L	8784	144	1,712	-851	-1,422	41.48	-310	4.2	1347	15%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65			NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	4.2	6185	70%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	604	1,083	35.42	184	PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	-1,865	4.1	5793	66%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub In	nformation								Sink Hub Info	rmation								Congestion I	ndicators	
					Average			D						Average	Manager		D			
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)		U90 Hours	U90 %
			Ť				,					·		\ /		,	(* /			
	SOCO_31_MSA_Atlanta_G	8775	11,765	1,583	3,912	9,527	50.80	1,744		EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	4.1	7012	80%
MISO MISO	ALTE_2_MSA_Madison_G AMRN 12 MSA StLouis L	8616 6699	1,665 5,059	441 6,066	604 757	1,083 1,937	35.42 36.76	184	PJM MISO	NI_3_MSA_Chicago_L AMRN 2 County Macon L	8784 8784	26 174	1,205 1,209	-634 -717	-1,254 -1,139	39.52 40.84	-220 -257	4.1 4.1	5794 3790	66% 43%
IVIISO	AWRN_12_WSA_StLouis_L	6699	5,059	0,000	757	1,937	30.76	100	IVIISO	AWRN_2_County_Macon_L	0/04	174	1,209	-/1/	-1,139	40.64	-257	4.1	3790	43%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	3,574	2,674	469	1,538	50.84	179	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	4.1	6656	76%
	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	42.60	535	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	4.1	4345	49%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88	793	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,209	-2,885	47.93	-509	4.0	5254	60%
SPP	WEDE 4 MOA Markattan O	8771	2.988	409	4.054	0.077	20.55	40.4	SPP	KACD 7 MCA KananaCity I	0704	0	4 204	-691	4.054	40.50	240	4.0	0055	070/
	WERE_1_MSA_Manhattan_G TVA 4 MSA Clarksville G	8616	2,966	150	1,354 2.096	2,277 2.473	36.55 43.88		-	KACP_7_MSA_KansasCity_L TVA 7 MSA Memphis L	8784 8773	7,215	1,291 5.982	-1.502	-1,351 -4.034	40.59 47.91	-246 -631	4.0	3255 5323	37% 61%
NYPP	NYISO 3 NYC	8784	6.711	2.657	1.813	3.003	58.65			NEPOOL 10 RI	6570	2.062	2,203	-406	-1,222	62.60	-167	4.0	8771	100%
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	42.60		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	3.9	3891	44%
										AP_7_MSA_Hagerstown-										
PJM	VAP_7_G	6936	4,179	303	1,656	3,629	56.01	0.0	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	59.93	-348	3.9	5242	60%
MISO NYPP	WEC_1_MSA_Chicago_G NYISO 3 NYC	8784 8784	1,728 6,711	303 2.657	896 1.813	1,140 3.003	33.61 58.65		MISO PJM	WEC_3_MSA_Milwaukee_G PSEG 8 MSA NewYork G	6898 8784	1,429 3.860	2,423 3,654	-264 -1.122	-1,143 -2,398	37.53 62.55	-68 -617	3.9	87 7219	1% 82%
INTER	NTISO_3_NTC	0704	0,711	2,007	1,013	3,003	36.03	934	FJIVI	SOCO_32_MSA_Pascagoula_	0/04	3,000	3,034	-1,122	-2,390	02.55	-017	3.8	7219	62%
TVAUTHOR	TVA 4 MSA Clarksville G	8616	2,544	150	2,096	2,473	43.88	793	SOUTHERN	G	1253	3,574	2,674	-240	-1,091	47.76	-14	3.9	5883	67%
	NEPOOL_7_CT	7641	4,447	3,920	689	1,728	63.04		NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	66.87	-445	3.8	8575	98%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89			AP_2_GEN_Albright3_L	8784	603	1,748	-1,036	-1,695	47.70	-434	3.8	4635	53%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,813	3,003	58.65			PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-951 -1.036	-1,856	62.39 47.70	-521	3.7	6771	77%
MISO MISO	FE_6_MSA_Pittsburgh_G ITC 7 MSA Monroe G	8784 8712	2,371 1,500	213	1,922 1,307	2,287 1,500	43.96 45.01			AP_2_GEN_Albright3_L FE 5 MSA Cleveland L	8784 6473	603 3,216	1,748 4,680	-1,036 -517	-1,695 -2,089	47.70	-434 -163	3.7 3.7	4632 5499	53% 63%
IVIIOO	ITC_7_MSA_MOTITOE_G	0712	1,500	U	1,507	1,500	45.01	313	WIGO	SOCO 10 MSA Albany-	0473	3,210	4,000	-517	-2,003	40.07	-103	5.7	3499	03%
VACAR	DUK_9_MSA_Charlotte_G	8780	14,681	9,966	3,106	5,530	50.48	1,377	SOUTHERN	Valdosta_L	7519	3,431	4,125	-701	-2,899	54.12	-285	3.6	363	4%
MISO	FE_9_MSA_Weirton_G	8571	1,860	112	1,269	1,807	44.07	480	PJM	AP_2_GEN_Albright3_L	8784	603	1,748	-1,036	-1,695	47.70	-434	3.6	4618	53%
										SOCO_10_MSA_Albany-										
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51	760	SOUTHERN	Valdosta_L SOCO 10 MSA Albany-	7519	3,431	4,125	-701	-2,899	54.12	-285	3.6	271	3%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1.090	1.369	1.917	50.59	597	SOUTHERN	Valdosta L	7519	3,431	4.125	-701	-2.899	54.12	-285	3.5	277	3%
MISO	ITC 3 MSA Detroit G	8784	3,815	1,600	1,266	1,933	45.14	502		FE_5_MSA_Cleveland_L	6473	3,216	4,680	-517	-2,089	48.67	-163	3.5	8397	96%
										SOCO_10_MSA_Albany-										
	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67	2,274		Valdosta_L	7519	3,431	4,125	-701	-2,899	54.12	-285	3.5	438	5%
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394	MISO	FE_5_MSA_Cleveland_L SOCO 10 MSA Albany-	6473	3,216	4,680	-517	-2,089	48.67	-163	3.4	4043	46%
SOUTHERN	SOCO 31 MSA Atlanta G	8775	11.765	1,583	3.912	9.527	50.80	1 744	SOUTHERN	Valdosta_L	7519	3,431	4,125	-701	-2.899	54.12	-285	3.3	275	3%
	NEPOOL 3 ME	3923	3,494	2,522	293	1,276	61.48		NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	-392	3.3	8769	100%
										SOCO_10_MSA_Albany-										
	SOCO_32_MSA_Pascagoula_G	7531	3,574	2,674	469	1,538	50.84			Valdosta_L	7519	3,431	4,125	-701	-2,899	54.12	-285	3.3	1382	16%
NEPOOL NYPP	NEPOOL_5_SEMA NYISO 6 NYF	8784 7469	6,454 4,103	3,978 1,983	1,952 522	3,703 1,558	63.66 61.60		NYPP NEPOOL	NYISO_9_NYI NEPOOL 9 NWKST	8467 8784	405	1,476 1,524	-786 -689	-1,993 -1,135	66.87 64.79	-445 -392	3.2	8605 8770	98% 100%
INTER	NTISO_6_NTF	7409	4,103	1,903	322	1,000	01.00	240	NEFOOL	INEFOOL_9_INVICTI	0/04	400	1,324	-009	-1,133	04.79	-392	3.2	8//0	100%
NYPP	NYISO 3 NYC	8784	6,711	2,657	1,813	3,003	58.65	934	PJM	PSEG 5 MSA Philadelphia L	8784	2,143	2,766	-1,072	-2,213	61.65	-580	3.0	7153	81%
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68			TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	3.0	5784	66%
NEPOOL	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82	531		NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	-392	3.0	8780	100%
SPP NYPP	AEPW_9_MSA_MountPleasant_0	7676 8784	8,168 2.021	3,832 973	715 1.581	1,919 1,945	46.57 65.27	255 906		EES_9_MSA_Russellville_G NYISO 10 NYJ	6251 8784	6,123 10,283	4,517 11,493	-444 -3,670	-1,630 -5,413	49.53 68.19	-137 -2,198	3.0 2.9	8735 8783	99% 100%
FRCC	NYISO_8_NYH SEC_6_MSA_Palatka_G	8784 8160	1,330	9/3	1,581	1,945	56.40		FRCC	FPL_2_MSA_FortMyers_G	8784 8506	5,929	4,563	-3,670	-5,413	59.29	-2,198 -521	2.9	4261	49%
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68			EES_9_MSA_Russellville_G	6251	6,123	4,517	-444	-1,630	49.53	-137	2.8	2323	26%
MISO	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76	186	PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	-1,865	2.8	5519	63%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88			AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	2.8	5272	60%
MISO	AMRN_12_MSA_StLouis_L	6699	5,059	6,066	757	1,937	36.76			NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	39.52	-220	2.8	5341	61%
MISO FRCC	EKPC_8_MSA_Maysville_G FPL_8_MSA_PortStLucie_G	8784 8763	1,396 10.364	272 4,623	936 1,943	1,366 5,374	45.18 58.77		FRCC	TVA_3_MSA_Knoxville_L FPL_7_MSA_Miami_L	8784 8784	3,684 570	5,102 3,923	-1,209 -2,488	-2,885 -4.070	47.93 61.50	-509 -1.344	2.8 2.7	5027 3402	57% 39%
MISO	FE 6 MSA Pittsburgh G	8784	2,371	213	1,943	2,287	43.96		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	2.7	5322	61%
FRCC	FPL_8_MSA_PortStLucie_G	8763	10,364	4,623	1,943	5,374	58.77		FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	2.7	2924	33%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,409	6,440	57.98	1,736		AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	60.64	-425	2.7	3766	43%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	43.88		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	2.7	5897	67%
PJM PJM	AEP_8_GEN_Amos01_G AEP 8 GEN Amos01 G	8783 8783	19,694 19,694	6,544 6,544	6,016 6,016	10,177 10,177	45.31 45.31	2,394		TVA_3_MSA_Knoxville_L TVA 7 MSA Memphis L	8784 8773	3,684 7,215	5,102 5,982	-1,209 -1,502	-2,885 -4.034	47.93 47.91	-509 -631	2.6 2.6	5862 5450	67% 62%
MISO	FE_6_MSA_Pittsburgh_G	8783 8784	2,371	213	1,922	2,287	43.96		PJM	AEP_1_MSA_Lynchburg_G	8773 8784	7,215 843	2,162	-1,502 -1,537	-4,034	46.54	-631 -628	2.6	6207	71%
		5.54	2,071	210	1,022	_,_0,	.0.00	. 42		EES_7_MSA_Beaumont-	3.04	540	2,102	.,007	2,200	.0.04	520	2.0	0201	70
SPP	AEPW_9_MSA_MountPleasant_0	7676	8,168	3,832	715	1,919	46.57		ENTERGY	PortArthur_G	6739	7,393	4,949	-473	-1,685	49.15	-157		8728	99%
MISO	FE_9_MSA_Weirton_G	8571	1,860	112	1,269	1,807	44.07		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638		5052	58%
PJM MISO	NI_7_MSA_Rochelle_G	8784 8571	2,290 1,860	0 112	2,119 1,269	2,290 1,807	34.96 44.07			WEC_3_MSA_Milwaukee_G	6898 8784	1,429 843	2,423 2,162	-264 -1,537	-1,143 -2,299	37.53 46.54	-68 -628		4580	52%
IVIIOU	FE_9_MSA_Weirton_G	1,00	1,000	112	1,209	1,007	44.07	460	ı JIVI	AEP_1_MSA_Lynchburg_G	0/04	043	2,102	-1,537	-2,299	40.04	-028	2.5	6050	69%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub Ir	formation								Sink Hub Info	rmation								Congestion I	ndicators	$\overline{}$
					Average									Average						
					net	Max net	Average	Revenue			0.1			net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)		U90 Hours	U90 %
PJM	TVA_1_MSA_Chatt-Hunts_G VAP 1 MSA Richmond G	8782 8784	17,334 10,524	9,966 3,579	3,221 3,409	6,196 6,440	48.57 57.98	1,374 1,736		LGEE_5_MSA_Lexington_L VAP 33 MSA DC L	8784 8784	595 910	2,345 2,983	-1,652 -1,730	-2,690 -2,599	51.03 60.40	-740 -918	2.5 2.4	1148 3941	13% 45%
FJIVI	VAF_I_W3A_RICHHIOHI_G	0/04	10,324	3,319	3,409	0,440	37.90	1,730	FJIVI	AEP 9 MSA Canton-	0/04	910	2,963	-1,730	-2,599	60.40	-910	2.4	3941	4576
міѕо	IPL_2_MSA_Jasper_G	8784	1,678	0	1.431	1,664	42.60	535	PJM	Massillon L	8784	733	2,120	-1.481	-2,058	44.99	-585	2.4	2435	28%
PJM	AEP 8 GEN Amos01 G	8783	19.694	6,544	6.016	10,177	45.31	2.394		AP 2 GEN Albright3 L	8784	603	1,748	-1.036	-1.695	47.70	-434	2.4	6148	70%
PJM	AEP 8 GEN Amos01 G	8783	19,694	6,544	6,016	10,177	45.31	-,	VACAR	CPLE 1 MSA Durham G	941	10,224	8,563	-313	-1.346	47.67	-14		6859	78%
SPP	AEPW 9 MSA MountPleasant (	7676	8,168	3,832	715	1,919	46.57	255	ENTERGY	EES 1 MSA Jackson L	8784	3,218	3,066	-1,227	-1,983	48.92	-527		8734	99%
SPP	AEPW_5_MSA_Tulsa_G	7426	4,226	2,571	406	1,330	47.19			EES_9_MSA_Russellville_G	6251	6,123	4,517	-444	-1,630	49.53	-137	2.3	5900	67%
PJM	PJM500_7_MSA_York-Hanover_	8784	2,696	0	2,195	2,570	60.81	1,172	PJM	VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	-118	2.3	6627	75%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,409	6,440	57.98	1,736	PJM	VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	60.24	-339	2.3	3044	35%
MISO	NIPS_8_MSA_Chicago_G	8765	2,892	1,694	940	1,665	37.31	307	PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,366	-9,115	39.56	-1,865	2.3	162	2%
	-									-										
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,302	-2,646	50.79	-581	2.2	155	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	50.79	-475	2.2	225	3%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	50.79	-816	2.2	194	2%
	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57			SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,807	-2,983	50.78	-806	2.2	104	1%
MISO	NIPS_8_MSA_Chicago_G	8765	2,892	1,694	940	1,665	37.31	307	PJM	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	39.52	-220	2.2	5	0%
	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51	760	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,215	-2,649	52.70	-562	2.2	2686	31%
	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48			NEPOOL_6_WCMA	8643	4,285	3,417	-1,343	-3,453	63.68	-739	2.2	6854	78%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48	71	NEPOOL	NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,898	63.65	-759	2.2	6692	76%
	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	SOUTHERN	SOCO_21_MSA_Atlanta_G	8765	3,334	2,733	-888	-1,940	50.72	-395	2.2	15	0%
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	908	1,345	57.15	456	FRCC	FPL_2_MSA_FortMyers_G	8506	5,929	4,563	-1,034	-2,343	59.29	-521	2.1	4246	48%
										SOCO_6_MSA_Augusta-										
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	SOUTHERN	Richmond_L	8784	0	1,187	-657	-1,116	50.70	-293	2.1	10	0%
	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,369	1,917	50.59	597		SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,215	-2,649	52.70	-562	2.1	2728	31%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	604	1,083	35.42	184		WEC_3_MSA_Milwaukee_G	6898	1,429	2,423	-264	-1,143	37.53	-68	2.1	1867	21%
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	0	1,232	1,330	56.40		FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335	58.48	-756	2.1	3971	45%
NYPP	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60	240		NEPOOL_6_WCMA	8643	4,285	3,417	-1,343	-3,453	63.68	-739	2.1	7183	82%
	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60		NEPOOL	NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,898	63.65	-759	2.0	7210	82%
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,421	1,584	57.25	714	FRCC	FPL_2_MSA_FortMyers_G	8506	5,929	4,563	-1,034	-2,343	59.29	-521	2.0	4967	57%
					=															
	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	5,796	50.67		VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,215	-2,649	52.70	-562	2.0	1133	13%
FRCC	FPC_10_MSA_Lakeland_G	8021	3,561	747	1,087	2,004	59.53	519	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	61.50	-1,344	2.0	4293	49%
ODD	AEDW 5 MOA Tules O	7400	4.000	0.574	400	4 000	47.40	440	ENTEROY	EES_7_MSA_Beaumont-	0700	7.000	4.040	470	4 005	40.45	457	0.0	0404	700/
SPP	AEPW_5_MSA_Tulsa_G	7426	4,226	2,571	406	1,330	47.19	142	ENTERGY	PortArthur_G	6739	7,393	4,949	-473	-1,685	49.15	-157	2.0	6181	70%
P.IM	VAD 4 MOA Bishared O	0704	40.504	0.570	0.400	0.440	57.00	4 700	D.114	AP_7_MSA_Hagerstown-	0704	000	4.450	004	4 000	50.00	0.40	0.0	4045	500/
. 0	VAP_1_MSA_Richmond_G	8784 8021	10,524	3,579	3,409	6,440	57.98	1,736		Martinsburg_L	8784	203	1,153	-661 -1.951	-1,009	59.93	-348 -1.053	2.0	4615	53%
FRCC	FPC_10_MSA_Lakeland_G	8021	3,561	747	1,087	2,004	59.53	519	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,951	-4,084	61.44	-1,053	1.9	4292	49%
COLITUEDAL	SOCO 31 MSA Atlanta G	8775	11,765	1.583	3,912	9.527	50.80	4 744	VACAR	SCPSA 2 MSA Charleston L	8784	1,607	3,236	-1,215	-2.649	52.70	-562	1.9	2717	040/
SOUTHERN	SOCO_31_WSA_Alianta_G	6775	11,700	1,363	3,912	9,327	30.60	1,744	VACAR	SCFSA_Z_WSA_Charleston_L	0704	1,007	3,230	-1,210	-2,049	32.70	-302	1.9	2/1/	31%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	3,574	2.674	469	1,538	50.84	179	VACAR	SCPSA 2 MSA Charleston L	8784	1.607	3,236	-1,215	-2,649	52.70	-562	1.9	4297	49%
	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82		NEPOOL	NEPOOL_6_WCMA	8643	4,285	3,417	-1,213	-3,453	63.68	-739	1.9	6868	78%
	NEPOOL_2_NH	8426	4,204	2,621	1,020	1,855	61.82			NEPOOL_4_NEBOS	8691	3,262	5,904	-1,372	-3,433	63.65	-759	1.8	6695	76%
	IESO_15_G	8382	1,964	3,375	1,020	2,054	44.34			NYISO_2_NYB	8784	650	1,759	-710	-1,588	46.16	-288		8449	96%
	PJM500_4_MSA_Philadelphia_G	8374	2,383	3,373	1,338	2,034	61.29			VAP_7_G	1848	4,179	303	-1,012	-1,772	63.09	-118	1.8	5933	68%
ONTARIO	IESO 6 G	8784	2,146	147	1,844	2,233	44.36			NYISO_2_NYB	8784	650	1,759	-710	-1,588	46.16	-288	1.8	8460	96%
ONTARIO	IESO 7 G	8784	2,953	253	2,502	2,825	44.36			NYISO 2 NYB	8784	650	1,759	-710	-1,588	46.16	-288	1.8	8528	97%
PJM	PJM500_5_MSA_DC_G	8784	1,730	255	1,516	1,730	61.31		PJM	VAP_7_G	1848	4,179	303	-1.012	-1,772	63.09	-118	1.8	5260	60%
NEPOOL	NEPOOL 7 CT	7641	4,447	3,920	689	1,730	63.04		NEPOOL	NEPOOL_9_NWKST	8784	4,179	1,524	-1,012	-1,172	64.79	-392	1.7	8754	100%
SPP	AEPW 5 MSA Tulsa G	7426	4,226	2,571	406	1,330	47.19			EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,227	-1,133	48.92	-527	1.7	5562	63%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	2,371	1,922	2,287	43.96		MISO	ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	-396	1.7	7045	80%
MISO	LGEE 3 GEN Gehnt2 G	8784	2,000	225	1,486	1.894	41.68		MISO	CIN_1_MSA_Indianapolis_L	8784	816	4.274	-2,181	-3,310	43.40	-831	1.7	4263	49%
		0,04	2,000	220	1,700	1,004	+1.00	5-14		SOCO_10_MSA_Albany-	0,04	510	7,214	2,101	3,510	+010	001	···/	7200	75/0
VACAR	SCEG 1 MSA Columbia G	7968	4,954	2,752	946	2,516	52.49	396	SOUTHERN	Valdosta L	7519	3,431	4,125	-701	-2,899	54.12	-285	1.6	445	5%
MISO	FE 9 MSA Weirton G	8571	1,860	112	1,269	1,807	44.07		MISO	ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	-396	1.6	6876	78%
NYPP	NYISO 8 NYH	8784	2,021	973	1,581	1,945	65.27		NYPP	NYISO 9 NYI	8467	7,001	1,476	-786	-1,993	66.87	-445	1.6	6506	74%
	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,494	4,092	39.26	1,205		AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	40.84	-257	1.6	4280	49%
	DPL_8_GEN_Killen_G	8784	2,964	.,250	2,184	2,940	45.08			AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	1.6	1917	22%
		0.04	_,004		2,.54	2,0 70	.0.00	550			3.34	.,254	2,0.7	1,007	2,070	.0.00	550			
VACAR	SCPSA_10_MSA_Charleston_G	8616	1,680	0	1,474	1,680	51.19	650	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,215	-2,649	52.70	-562	1.5	2236	25%
			.,		, ., .	.,,500	20					.,	-,00	.,	_,,		-02			

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2008R2

Source Hub Ir	nformation								Sink Hub Info	rmation								Congestion In	ndicators	
					Average									Average						
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential I		U90 %
	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,421	1,584	57.25		FRCC	TECO_7_MSA_Tampa_L	8784	0	1,481	-951	-2,004	58.75	-491	1.5	3645	41%
	EKPC_8_MSA_Maysville_G	8784	1,396	272	936	1,366	45.18		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	1.5	1411	16%
	DPL_8_GEN_Killen_G	8784	2,964	0	2,184	2,940	45.08		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	1.5	3115	35%
	CIN_3_MSA_TerreHaute_G	7034	3,230	1,015	726	2,206	45.20		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	1.5	3844	44%
	NI_15_MSA_Davenport_G	8664	2,479	0	1,717	2,314	33.05		MISO	WEC_7_MSA_Milwaukee_G	8069	3,850	3,052	-556	-1,659	34.50	-155	1.4	4719	54%
PJM	NI_6_MSA_Chicago_G	8111	9,759	7,577	1,023	2,890	39.39	327	MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	40.84	-257	1.4	4234	48%
	EES_4_GEN_Ouachita_G	5418	6,345	2,417	1,230	3,507	53.53			EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,947	-5,217	54.91	-1,421	1.4	6326	72%
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394		AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,557	-2,640	46.65	-638	1.3	9	0%
	CIN_3_MSA_TerreHaute_G	7034	3,230	1,015	726	2,206	45.20			AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	1.3	3172	36%
	IESO_15_G	8382	1,964	3,375	1,098	2,054	44.34		MISO	ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	-396	1.3	8708	99%
PJM	VAP_7_G	6936	4,179	303	1,656	3,629	56.01			VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-572	-1,149	57.34	-288	1.3	5475	62%
	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48			NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	1.3	6712	76%
	IESO_6_G	8784	2,146	147	1,844	2,071	44.36			ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	-396	1.3	8718	99%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	44.36		MISO	ITC_2_MSA_Detroit_L	8541	4,001	5,247	-1,015	-3,744	45.68	-396	1.3	8724	99%
	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	43.89			FE_4_MSA_Akron_L	8784	531	2,277	-1,227	-1,849	45.16	-487	1.3	1832	21%
	PJM500_4_MSA_Philadelphia_G	8374	2,383	0	1,338	2,295	61.29		PJM	PSEG_8_MSA_NewYork_G	8784	3,860	3,654	-1,122	-2,398	62.55	-617	1.3	7112	81%
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68			TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,209	-2,885	47.93	-509	1.3	3712	42%
	PL_8_MSA_Allentown_G	6898	2,853	385	409	2,259	61.07		PJM	JCPL_1_MSA_NewYork_L	8784	0	1,792	-862	-1,934	62.32	-472	1.2	7808	89%
PJM	AEP_8_GEN_Amos01_G	8783	19,694	6,544	6,016	10,177	45.31	2,394	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,537	-2,299	46.54	-628	1.2	3206	36%
						= 0.40	====	=												
	SOCO_15_MSA_Birmingham_G	8671	12,464	9,217	1,735	5,010	50.51			SCEG_9_MSA_Charleston_G	8494	1,152	1,944	-360	-1,540	51.74	-158	1.2	2815	32%
	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,421	1,584	57.25			FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,471	-2,335	58.48	-756	1.2	2706	31%
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,951	2,769	46.68			TVA_7_MSA_Memphis_L	8773	7,215	5,982	-1,502	-4,034	47.91	-631	1.2	3294	38%
	NYISO_6_NYF	7469	4,103	1,983	522	1,558	61.60		NYPP	NYISO_7_NYG	7979	3,156	2,195	-673	-1,446	62.81	-337	1.2	5038	57%
	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96			FE_4_MSA_Akron_L	8784	531	2,277	-1,227	-1,849	45.16	-487	1.2	1792	20%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,922	2,287	43.96	742	MISO	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,072	-4,218	45.13	-822	1.2	7682	87%
							====													
	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,369	1,917	50.59	597		SCEG_9_MSA_Charleston_G	8494	1,152	1,944	-360	-1,540	51.74	-158	1.2	2841	32%
	NEPOOL_5_SEMA	8784	6,454	3,978	1,952	3,703	63.66			NEPOOL_9_NWKST	8784	405	1,524	-689	-1,135	64.79	-392 -167	1.1	8755	100%
NEPOOL	NEPOOL_3_ME	3923	3,494	2,522	293	1,276	61.48	71	NEPOOL	NEPOOL_10_RI	6570	2,062	2,203	-406	-1,222	62.60	-167	1.1	6688	76%
T) /ALITUOD	TVA 4 MOA Obstantille O	2040	0.544	450	0.000	0.470	40.00	700	D.114	AEP_9_MSA_Canton-	0704	700	0.400	4 404	0.050	44.99	505		5444	000/
	TVA_4_MSA_Clarksville_G	8616 8782	2,544	150 9,966	2,096 3,221	2,473	43.88		PJM	Massillon_L	8784 8541	733	2,120 8.858	-1,481 -1,543	-2,058	44.99	-585	1.1	5444	62%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,221	6,196	48.57	1,374	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	9,154	8,858	-1,543	-4,313	49.67	-655	1.1	120	1%
DIM	DI CO 7 MCA Dittabusah C	0040	1.644	25	4 240	4 000	43.89	405	PJM	AEP_9_MSA_Canton- Massillon L	8784	700	2 420	-1.481	-2.058	44.99	-585	1.1	4400	500/
	DLCO_7_MSA_Pittsburgh_G PJM500 4 MSA Philadelphia G	8616 8374	2,383	25	1,310 1,338	1,633 2,295	61.29		PJM	PSEG 3 MSA NewYork L	8784	733 1.843	2,120 2,275	-1,461	-2,056 -1.856	62.39	-565 -521	1.1	7009	50% 80%
	FE 9 MSA Weirton G	8571	1,860	112	1,336	1,807	44.07	480	MISO	FE 4 MSA Akron L	8784	531	2,275	-1.227	-1,849	45.16	-521 -487	1.1	3548	40%
IVIIOU	LE_A_INIOH_ANGILLOU_C	1,00	1,000	112	1,209	1,007	44.07	460	INIOO	FE_4_WISA_AKION_L	0/04	531	2,211	-1,227	-1,849	45.16	-48/	1.1	3548	40%
ENTERGY	EES 10 MSA Vicksburg G	8088	3,544	1,249	871	1,221	49.71	250	SOUTHERN	SOCO 16 MSA Atlanta L	8784	694	3,058	-1,302	-2,646	50.79	-581	1.1	1361	15%
ENTERGY	EES_TO_IVISA_VICKSDUIG_G	8000	3,544	1,249	6/1	1,227	49.71	350	SOUTHERN	SOCO_IB_WSA_ATIANTA_L	0/84	694	3,058	-1,302	-2,046	50.79	-581	1.1	1301	15%
TVALITHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17.334	9.966	3,221	6.196	48.57	1.374	SOUTHERN	SOCO 17 MSA Mobile G	6709	5.205	4.575	-434	-1.703	49.65	-145	1.1	2782	32%
IVAUITOR	I VA_I_WOA_CHAIL-HUHS_G	0102	17,334	3,300	3,221	0,190	40.57	1,374	SOUTHERN	3000_17_IVISA_IVIODIIE_G	0709	5,205	4,575	-434	-1,703	49.05	-145	1.1	2162	32%
ENTERGY	EES 10 MSA Vicksburg G	8088	3,544	1,249	871	1,221	49.71	350	SOUTHERN	SOCO 8 MSA Atlanta L	8784	_	1,925	-1.065	-1,811	50.79	-475	1.1	1411	16%
LINIERGI	LLO_TO_IVIOA_VICKSDUIY_G	0000	3,344	1,249	0/1	1,221	48.71	350	SOUTHERN	5000_6_WSA_Allanta_L	0/04	U	1,825	-1,000	-1,011	50.79	-4/5	1.1	1411	10%
ENTERGY	EES 10 MSA Vicksburg G	8088	3.544	1,249	871	1,221	49.71	350	SOUTHERN	SOCO 33 MSA Atlanta L	8784	2	3.305	-1.828	-3,110	50.79	-816	1.1	1407	16%
LIVILINGI	LLO_IVIOM_VICKSDUIY_G	0000	5,544	1,249	0/1	1,441	43.71	330	COUTTLERIN	5550_55_WISA_AllaHta_L	0704	3	3,303	-1,020	-3,110	50.79	-010	1.1	1407	10%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	871	1,221	49.71	350	SOUTHERN	SOCO 5 GEN GEPCHY L	8784	2,098	3,403	-1,807	-2,983	50.78	-806	1.1	1327	15%
	SOCO 26 MSA Macon G	8784	6,802	1,249	5,109	5,796	50.67		VACAR	SCEG 9 MSA Charleston G	8494	1,152	1,944	-1,807	-1,540	51.74	-158	1.1	2773	32%
	FE 9 MSA Weirton G	8571	1,860	112	1,269	1,807	44.07		MISO	ITC 9 MSA Detroit L	8784	1,152	4,751	-2.072	-4,218	45.13	-822	1.1	7579	86%
	MEC 3 MSA DesMoines G	7991	3,307	1.933	908	1,431	29.65		MAPP	OPPD 5 MSA Omaha L	8784	480	1,686	-2,072	-1,521	30.69	-228	1.0	2138	24%
	FE 6 MSA Pittsburgh G	8784	2,371	213	1,922	2,287	43.96	742		AEP 9 MSA Canton-Massillon	8784	733	2,120	-1.481	-2,058	44.99	-585	1.0	4355	50%
	EES 10 MSA Vicksburg G	8088	3,544	1,249	871	1,221	49.71			SOCO 21 MSA Atlanta G	8765	3,334	2,120	-1,461	-1,940	50.72	-395	1.0	1238	14%
LITTLINGT	LLO_10_WOA_VICKSDUIY_G	0000	3,344	1,249	0/1	1,441	43.71	550	COUTTERIN	CCCC_Z1_WOA_Allanta_G	0700	3,334	2,133	-000	-1,340	30.72	-595	1.0	1230	1470

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub Ir	nformation								Sink Hub Info	rmation								Congestion	ndicators	
Oddree Hab II	nomidatori				Average				Olink Flub IIIIo	mation				Average				Congestion	Indicators	
		0	0	1	net	Max net	Average	Revenue			0:-1-	0	Land	net	Max net	Average	Revenue	Price		
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Differential	U90 Hours	U90 %
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671	NEPOOL	NEPOOL_7_CT	1106	4,447	3,920	-339	-1,095	87.32	-33	36.6	6671	76%
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	47.25		NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	35.1	6676	76%
ONTARIO ONTARIO	IESO_7_G IESO 15 G	8784 8385	2,953 1,964	253 3,375	2,502 1,097	2,825 2,054	47.25 47.28		NYPP NYPP	NYISO_11_NYK NYISO 11 NYK	8784 8784	5,681 5,681	5,289 5,289	-1,945 -1,945	-2,703 -2,703	82.36 82.36	-1,407 -1,407	35.1 35.1	6676 6676	76% 76%
ONTARIO	IESO 6 G	8784	2,146	147	1,844	2,034	47.25	765		NYISO_10_NYJ	8784	10.283	11,493	-3,846	-5,293	80.87	-2,732	33.6	8784	100%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	47.25	1,039	NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	33.6	8784	100%
ONTARIO	IESO_15_G	8385	1,964	3,375	1,097	2,054	47.28	435		NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	33.6	8784	100%
ONTARIO ONTARIO	IESO_6_G IESO 7 G	8784 8784	2,146 2,953	147 253	1,844 2,502	2,071 2,825	47.25 47.25	765 1,039	NYPP NYPP	NYISO_9_NYI NYISO_9_NYI	8467 8467	2	1,476 1,476	-786 -786	-1,993 -1,993	79.19 79.19	-527 -527	31.9 31.9	6667 6668	76% 76%
ONTARIO	IESO_7_G IESO_15_G	8385	1,964	3,375	1,097	2,023	47.28	435		NYISO 9 NYI	8467	2	1,476	-786	-1,993	79.19	-527	31.9	6666	76%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	31.6	6676	76%
MAPP	MEC_3_MSA_DesMoines_G	7974	3,307	1,933	904	1,380	31.70		MISO	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	-60	30.6	3889	44%
NYPP NYPP	NYISO_1_NYA NYISO 1 NYA	8272 8272	4,946 4,946	2,500 2,500	1,598 1,598	2,466 2,466	50.73 50.73		NYPP NYPP	NYISO_10_NYJ NYISO_9_NYI	8784 8467	10,283	11,493 1,476	-3,846 -786	-5,293 -1,993	80.87 79.19	-2,732 -527	30.1 28.5	8784 6591	100% 75%
	IESO_6_G	8784	2,146	147	1,844	2,400	47.25		NYPP	NYISO_7_NYG	8388	3.156	2,195	-698	-1,444	74.41	-436	27.2	6665	76%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	47.25	1,039	NYPP	NYISO_7_NYG	8388	3,156	2,195	-698	-1,444	74.41	-436	27.2	6666	76%
ONTARIO	IESO_15_G	8385	1,964	3,375	1,097	2,054	47.28		NYPP	NYISO_7_NYG	8388	3,156	2,195	-698	-1,444	74.41	-436	27.1	6664	76%
PJM MISO	NI_15_MSA_Davenport_G OTP_9_GEN_BigStone_G	8664 8784	2,479 1,189	136	1,716 737	2,314 1,094	35.62 21.48		MISO MISO	AMRN_12_MSA_StLouis_L XEL_3_MSA_Minneapolis_G	2086 4678	5,059 7,596	6,066 7,622	-464 -853	-1,835 -2,814	62.26 48.01	-60 -192	26.6 26.5	5041 7790	57% 89%
PJM	PENELEC_2_MSA_DuBois_G	8404	2,724	1,196	821	1,658	56.52			NYISO 11 NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	25.8	6676	76%
										OKGE_4_MSA_OklahomaCity										
SPP PJM	WERE_1_MSA_Manhattan_G	8753	2,988	409	1,357	2,215	39.31		SPP	_L	8783	2,102	2,403	-821	-1,550	64.79	-467	25.5	8317	95%
PJM PJM	NI_7_MSA_Rochelle_G PENELEC_2_MSA_DuBois_G	8784 8404	2,290 2,724	1.196	2,119 821	2,290 1,658	37.75 56.52		MISO NYPP	AMRN_12_MSA_StLouis_L NYISO 10 NYJ	2086 8784	5,059 10,283	6,066 11,493	-464 -3,846	-1,835 -5,293	62.26 80.87	-60 -2,732	24.5 24.4	5648 6675	64% 76%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671		NYISO_7_NYG	8388	3,156	2,195	-698	-1,444	74.41	-436	23.7	6511	74%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671	NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-696	-1,248	74.26	-454	23.5	6681	76%
PJM	PENELEC_2_MSA_DuBois_G	8404	2,724	1,196	821	1,658	56.52	390		NYISO_9_NYI	8467	2	1,476	-786	-1,993	79.19	-527	22.7	6648	76%
NYPP NYPP	NYISO_3_NYC NYISO_1_NYA	8784 8272	6,711 4,946	2,657 2,500	1,860 1,598	2,732 2,466	65.41 50.73		NEPOOL NEPOOL	NEPOOL_6_WCMA	1106 8762	4,447 4,285	3,920 3,417	-339 -1,506	-1,095 -3,982	87.32 72.25	-33 -953	21.9 21.5	8771 6671	100% 76%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671	NEPOOL	NEPOOL_4_NEBOS	8656	3,262	5,904	-1,161	-3,970	72.00	-724	21.3	6671	76%
SPP P.IM	WERE_1_MSA_Manhattan_G NI_2_MSA_Chicago_G	8753 8784	2,988 5,342	409 1,283	1,357 3,495	2,215 4,144	39.31 42.11		SPP MISO	WERE_4_GEN_Wolfcreek_G	3670 2086	3,510 5,059	2,459 6.066	-486 -464	-1,564 -1.835	60.17 62.26	-107 -60	20.9 20.1	3405 3553	39% 40%
PJM	NI 6 MSA Chicago G	8068	9,759	7,577	994	2,629	42.11		MISO	AMRN_12_MSA_StLouis_L AMRN 12 MSA StLouis L	2086	5,059	6,066	-464	-1,835	62.26	-60	20.1	3560	41%
ENTERGY	EES 9 MSA Russellville G	2521	6,123	4,517	200	1,152	44.91	23	SPP	ONGE_4_WIGH_UKIAHUHIAURY	8783	2,102	2,403	-821	-1,550	64.79	-467	19.9	4293	49%
PJM	DLCO 7 MSA Pittsburgh G	8616	1,644	25	1,310	1,633	46.28	522		 AP_8_MSA_DC-VA-MD_L	8784	2,102	1,097	-798	-1,144	66.07	-463	19.8	7979	91%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37	783	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	66.07	-463	19.7	7968	91%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73		PJM	PSEG_8_MSA_NewYork_G	8784	3,860	3,654	-1,121	-2,452	70.38	-693	19.6	8192	93%
MISO NYPP	FE_9_MSA_Weirton_G NYISO_1_NYA	8610 8272	1,860 4,946	112 2.500	1,265 1,598	1,807 2,466	46.43 50.73		PJM PJM	AP_8_MSA_DC-VA-MD_L PSEG 3 MSA NewYork L	8784 8784	1.843	1,097 2,275	-798 -946	-1,144 -1,857	66.07 70.18	-463 -583	19.6 19.4	7943 8228	90% 94%
	NEPOOL 3 ME	4348	3,494	2,522	361	1,212	67.94		NEPOOL	NEPOOL_7_CT	1106	4,447	3,920	-339	-1,095	87.32	-33	19.4	7681	87%
PJM	NI_20_MSA_Chicago_G	7224	1,632	83	890	1,513	42.90		MISO	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	-60	19.4	3541	40%
MISO MAPP	IP_8_GEN_Clinton_G NPPD 4 GEN Gentleman G	8015 8760	2,302	1,195 148	913 635	1,230 1,481	42.92 14.17		MISO MAPP	AMRN_12_MSA_StLouis_L OPPD 5 MSA Omaha L	2086 8784	5,059 480	6,066 1,686	-464 -847	-1,835 -1,503	62.26 33.20	-60 -247	19.3 19.0	1786 8403	20% 96%
IVIAFF	NPPD_4_GEN_Gentieman_G	6760	2,702	140	633	1,401	14.17	19	WAFF	AP 7 MSA Hagerstown-	0/04	400	1,000	-047	-1,503	33.20	-241	19.0	0403	96%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	46.28	522	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	65.25	-379	19.0	7933	90%
										AP_7_MSA_Hagerstown-										
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37	783	PJM	Martinsburg_L AP_7_MSA_Hagerstown-	8784	203	1,153	-661	-1,009	65.25	-379	18.9	7921	90%
MISO	FE 9 MSA Weirton G	8610	1,860	112	1,265	1,807	46.43	506	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	65.25	-379	18.8	7901	90%
NEPOOL	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637	NEPOOL	NEPOOL_7_CT	1106	4,447	3,920	-339	-1,095	87.32	-33	18.4	7696	88%
NIVDD	1000 4 104	0070	4040	0.500	4.500	0.400	50.70	674	DIM	DOEO E MOA DESI-A-1111	0704	0.440	0.700	050	4.000	00.00	570	47.0	00.4-	0.4
NYPP PJM	NYISO_1_NYA PENELEC 2 MSA DuBois G	8272 8404	4,946 2,724	2,500 1,196	1,598 821	2,466 1,658	50.73 56.52		PJM NYPP	PSEG_5_MSA_Philadelphia_L NYISO 7 NYG	8784 8388	2,143 3,156	2,766 2,195	-959 -698	-1,990 -1,444	68.62 74.41	-578 -436	17.9 17.9	8248 6645	94% 76%
PJM	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	2,530		AP_8_MSA_DC-VA-MD_L	8784	0,750	1,097	-798	-1,144	66.07	-463	17.5	8064	92%
MISO	IP_7_GEN_Baldwin_G	8784	1,900	444	1,189	1,478	44.83		MISO	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	-60	17.4	994	11%
MISO PJM	BREC_3_County_Webster_G	8784 8782	1,355 19,694	476	906	1,164 10.177	37.08 48.54	295 2.530	MISO	LGEE_5_MSA_Lexington_L	8784	595 910	2,345 2,983	-1,651 -1,729	-2,733	54.41	-789 -999	17.3 17.3	7384	84%
PJM	AEP_8_GEN_Amos01_G AEP_8_GEN_Amos01_G	8782	19,694	6,544 6,544	5,935 5,935	10,177	48.54	2,530		VAP_33_MSA_DC_L VAP_27_MSA_DC_L	8784 8784	910	1,048	-1,729	-2,537 -1,075	65.82 65.61	-369	17.3	8124 8045	92% 92%
PJM	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	2,530		VAP_27_WSA_DC_L VAP_7_G	1879	4,179	303	-1,021	-1,075	65.53	-126	17.1	6743	77%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,860	2,732	65.41		NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	16.9	8784	100%
PJM NYPP	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	2,530		AP_7_MSA_Hagerstown-Martin	8784	203 4.447	1,153	-661	-1,009	65.25	-379	16.7	8038	92%
MISO	NYISO_6_NYF BREC 3 County Webster G	7530 8784	4,103 1,355	1,983 476	569 906	1,525 1,164	70.62 37.08	302 295	NEPOOL TVAUTHOR	NEPOOL_7_CT TVA 5 MSA Nashville L	1106 8531	4,447 9.154	3,920 8,858	-339 -1.542	-1,095 -4,313	87.32 53.67	-33 -706	16.7 16.6	8750 7778	100% 89%
MISO	CIN_8_MSA_Evansville_G	8783	3,657	260	2,479	3,391	46.16		MISO	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	-60	16.1	2278	26%
MISO	XEL_3_MSA_Minneapolis_G	4106	7,596	7,622	822	1,981	19.22		MISO	GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,007	-1,824	35.05	-310	15.8	0	0%
NYPP NEPOOL	NYISO_3_NYC	8784 8784	6,711 6,454	2,657 3,978	1,860 1,703	2,732	65.41 72.03	1,069	NYPP	NYISO_10_NYJ	8784 1106	10,283	11,493	-3,846 -339	-5,293 -1.095	80.87 87.32	-2,732	15.5	8783	100%
TVAUTHOR	NEPOOL_5_SEMA TVA 4 MSA Clarksville G	8784 8616	6,454 2,544	3,978	1,703 2,096	3,589 2,473	72.03 47.01	1,078 849	NEPOOL MISO	NEPOOL_7_CT AMRN 12 MSA StLouis L	1106 2086	4,447 5,059	3,920 6,066	-339 -464	-1,095 -1,835	87.32 62.26	-33 -60	15.3 15.2	2253 5952	26% 68%
SPP	AEPW_9_MSA_MountPleasant_	7978	8,168	3,832	800	1,815	50.17	320	SPP	OKGE_4_MSA_OklahomaCity_	8783	2,102	2,403	-821	-1,550	64.79	-467	14.6	4889	56%
	NI_15_MSA_Davenport_G	8664	2,479	0	1,716	2,314	35.62	530		AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	14.6	6943	79%
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14	198	I VAUTHOR	TVA_5_MSA_Nashville_L	8531	9,154	8,858	-1,542	-4,313	53.67	-706	14.5	5379	61%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub In	nformation								Sink Hub Info	rmation							ı	Congestion	Indicators	$\overline{}$
					Average			_						Average				J. J.		
			•		net	Max net	Average	Revenue			0: 1			net	Max net	Average	Revenue	ъ.		
Market Area	Hub Name	Source Hours	Gen Weight	Load	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
IVIAIREL AIEA	Hub Name	Hours	weigni	Weight	(IVIVV)	(IVIVV)	(Φ/ΙνΙννΙΙ)	(DIVIIVI)	Market Alea	Hub Name	Hours	weignt	vveigni	(IVIVV)	(IVIVV)	(\$/IVIVVII)	(DIVIIVI)	Dillerential	U90 Hours	090 %
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1.152	44.91	23	ENTERGY	EES 5 MSA NewOrleans G	8784	9.735	9,294	-2,952	-5,281	59.42	-1.541	14.5	6842	78%
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,949	2,769	50.33	861	SPP	OKGE_4_MSA_OklahomaCity_	8783	2,102	2,403	-821	-1,550	64.79	-467	14.5	6133	70%
PJM	NI_15_MSA_Davenport_G	8664	2,479	0	1,716	2,314	35.62	530	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	14.5	6081	69%
NEPOOL	NEPOOL_3_ME	4348	3,494	2,522	361	1,212	67.94	107		NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	14.4	8782	100%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8781	2,315	248	1,151	1,615	47.88	484	MISO	AMRN_12_MSA_StLouis_L	2086	5,059	6,066	-464	-1,835	62.26	-60	14.4	2912	33%
ENTERGY	FF0 0 1404 B            0	2521	6.123	4.517	200	1.152	44.91	00	SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	7471	3.431	4.125	-662	-2.746	58.74	-290	13.8	3444	000/
NYPP	EES_9_MSA_Russellville_G NYISO 3 NYC	8784	6,711	2,657	1,860	2,732	65.41		NYPP	NYISO 9 NYI	8467	3,431	1,476	-662	-2,746	79.19	-527	13.8	3444 8697	39% 99%
PJM	AEP 8 GEN Amos01 G	8782	19,694	6,544	5,935	10,177	48.54	2,530		AMRN 12 MSA StLouis L	2086	5,059	6,066	-464	-1,835	62.26	-60	13.7	748	99%
PJM	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	2,530		VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-594	-1.149	62.16	-324	13.6	8015	91%
PJM	NI 15 MSA Davenport G	8664	2,479	0	1,716	2,314	35.62		PJM	NI 6 MSA Chicago G	716	9,759	7,577	-320	-1,221	49.17	-11	13.6	4732	54%
NEPOOL	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	13.4	8782	100%
SPP	AEPW_5_MSA_Tulsa_G	7478	4,226	2,571	420	1,245	51.57	162	SPP	OKGE_4_MSA_OklahomaCity_	8783	2,102	2,403	-821	-1,550	64.79	-467	13.2	1445	16%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,134	35.99	283	PJM	NI_6_MSA_Chicago_G	716	9,759	7,577	-320	-1,221	49.17	-11	13.2	4466	51%
																				i l
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,134	35.99		MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-758	-1,367	48.95	-326	13.0	5758	66%
NEPOOL SOUTHERN	NEPOOL_3_ME SOCO 15 MSA Birmingham G	4348 8623	3,494 12,464	2,522 9,217	361 1.611	1,212 4,984	67.94 54.34		NYPP	NYISO_10_NYJ FPL 7 MSA Miami L	8784 8784	10,283	11,493 3,923	-3,846 -2,488	-5,293 -4,070	80.87	-2,732 -1,469	12.9 12.9	8784 5718	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G SOCO 15 MSA Birmingham G	8623 8623	12,464 12,464	9,217	1,611 1,611	4,984 4,984	54.34	755 755	FRCC FRCC	FPL_7_MSA_Miami_L FPL 3 MSA Miami L	8784 8784	570 6,944	7,089	-2,488 -1,934	-4,070 -4,084	67.21 67.15	-1,469 -1,141	12.9 12.8	5718 5354	65% 61%
OCCITIENT	SOCO 28 MSA Birmingham G	8623	2,535	1.090	1,611	1,917	54.53		FRCC	FPL_3_MSA_MIAMI_L FPL 7 MSA Miami L	8784 8784	570	3,923	-1,934	-4,084	67.15	-1,141	12.8	5715	65%
SOUTHERN	SOCO 26 MSA Macon G	8784	6,802	1,090	5,109	6,381	54.56		FRCC	FPL 7 MSA Miami L	8784	570	3,923	-2,488	-4,070	67.21	-1,469	12.7	5472	62%
	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,398	1,917	54.53	657	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	12.6	5353	61%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	6,381	54.56	2,449	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	12.6	5478	62%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	1,885	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	67.21	-1,469	12.5	5712	65%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	1,885		FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	12.4	5352	61%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	37.75	703		AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	12.4	6582	75%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	37.75	703	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	12.3	6030	69%
ENTERGY	AFOL 4 OFN Novahadrida O	8781	2,315	248	1,151	1,615	47.88	404	SPP	WERE 4 GEN Wolfcreek G	3670	3,510	2,459	-486	-1,564	60.17	-107	12.3	7585	000/
ENTERGT	AECI_4_GEN_NewMadrid1_G	0/01	2,313	240	1,131	1,013	47.00	404	SFF	AEP_9_MSA_Canton-	3070	3,310	2,439	-400	-1,304	60.17	-107	12.3	7585	86%
PJM	NI 15 MSA Davenport G	8664	2,479	0	1.716	2.314	35.62	530	PJM	Massillon_L	8784	733	2.120	-1.491	-2,063	47.87	-627	12.3	5265	60%
	MEC_3_MSA_DesMoines_G	7974	3,307	1.933	904	1,380	31.70		MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	43.77	-276	12.1	5616	64%
	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17		FRCC	FPL 7 MSA Miami L	8784	570	3,923	-2,488	-4,070	67.21	-1,469	12.0	5932	68%
	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17	184	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	12.0	5600	64%
NEPOOL	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637		NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	11.9	8784	100%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,358	1,700	55.44		PJM	BGE_9_MSA_Baltimore-Towso	8784	0	1,186	-681	-1,226	67.28	-403	11.8	7936	90%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,134	35.99		MISO	METC_8_MSA_BayCity_G	8357	3,795	2,562	-547	-1,369	47.82	-219	11.8	5988	68%
NYPP	NYISO_6_NYF	7530	4,103	1,983	569	1,525	70.62	302	NYPP	NYISO_11_NYK SOCO_10_MSA_Albany-	8784	5,681	5,289	-1,945	-2,703	82.36	-1,407	11.7	8783	100%
TVAUTHOR	TVA 4 MSA Clarksville G	8616	2,544	150	2,096	2,473	47.01	940	SOUTHERN	Valdosta L	7471	3.431	4.125	-662	-2,746	58.74	-290	11.7	5514	63%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,528	3.886	55.06	1.222		PEPCO_1_MSA_DC_L	8784	0,401	1,439	-847	-1,492	66.76	-497	11.7	7714	88%
PJM	PJM500 3 MSA Pittsburgh G	8784	1,705	0	1,358	1,700	55.44	661	PJM	PL 7 MSA Allentown L	8784	245	1,051	-643	-1,025	66.98	-378	11.5	8695	99%
			,		,	,				BGE_10_MSA_Baltimore-			,		, ,					
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,358	1,700	55.44	661	PJM	Towson_L	8784	845	1,565	-572	-1,323	66.88	-336	11.4	7888	90%
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	37.75		PJM	NI_6_MSA_Chicago_G	716	9,759	7,577	-320	-1,221	49.17	-11	11.4	4347	49%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,358	1,700	55.44	661	PJM	PEPCO_1_MSA_DC_L	8784	0	1,439	-847	-1,492	66.76	-497	11.3	7790	89%
5.114		0704	4 705		4.050	4.700			D. 11.4	BGE_5_MSA_Baltimore-	0704	000	4 400	700	4.000	00.70	400			i
PJM NEPOOL	PJM500_3_MSA_Pittsburgh_G NEPOOL 3 ME	8784 4348	1,705 3,494	2,522	1,358 361	1,700 1,212	55.44 67.94		PJM NYPP	Towson_L NYISO 9 NYI	8784 8467	263	1,462 1,476	-733 -786	-1,299 -1,993	66.73 79.19	-429 -527	11.3 11.2	7874 8756	90% 100%
NEPOOL	NEPOOL_3_ME NEPOOL_7_CT	7678	4,447	3,920	726	1,796	71.28		NYPP	NYISO_9_NTI NYISO 11 NYK	8784	5,681	5,289	-1.945	-2,703	82.36	-1,407	11.2	8782	100%
	332_7_01		.,	3,020	.20	.,,,,	20	337		BGE 9 MSA Baltimore-	5.04	0,001	0,200	.,040	2,730	32.00	.,		0102	10076
PJM	PJM500 9 MSA Pittsburgh G	8784	1,700	0	1,474	1,700	56.21	728	PJM	Towson_L	8784	0	1,186	-681	-1,226	67.28	-403	11.1	7861	89%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	606	1,085	38.13		PJM	NI_6_MSA_Chicago_G	716	9,759	7,577	-320	-1,221	49.17	-11	11.0	5715	65%
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14	198		AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	11.0	6810	78%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,528	3,886	55.06	1,222	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	66.07	-463	11.0	7555	86%
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	10.9	6601	75%
PJM PJM	PJM500_9_MSA_Pittsburgh_G	8784 8784	1,700 6,563	2,223	1,474 2,528	1,700 3,886	56.21 55.06	1,222	PJM	PL_7_MSA_Allentown_L VAP_33_MSA_DC_L	8784 8784	245 910	1,051 2,983	-643 -1,729	-1,025 -2,537	66.98 65.82	-378 -999	10.8 10.8	8419	96% 87%
r JIVI	AP_1_County_Harrison_G	8/84	0,003	2,223	2,528	3,886	25.06	1,222	r JIVI	BGE 10 MSA Baltimore-	8784	910	2,983	-1,729	-2,53/	<del>ს</del> ე.82	-999	10.8	7645	8/%
P.JM	PJM500 9 MSA Pittsburgh G	8784	1.700	n	1.474	1,700	56.21	728	PJM	Towson L	8784	845	1,565	-572	-1,323	66.88	-336	10.7	7814	89%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,358	1,700	55.44		PJM	AP 8 MSA DC-VA-MD L	8784	0.0	1,097	-798	-1,144	66.07	-463	10.6	7846	89%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,528	3,886	55.06	1,222	PJM	VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	65.61	-369	10.6	7518	86%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,474	1,700	56.21		PJM	PEPCO_1_MSA_DC_L	8784	0	1,439	-847	-1,492	66.76	-497	10.5	7794	89%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73	671	NEPOOL	NEPOOL_3_ME	4436	3,494	2,522	-218	-1,038	61.25	-59	10.5	6795	77%
	-									BGE_5_MSA_Baltimore-										
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,474	1,700	56.21		PJM	Towson_L	8784	263	1,462	-733	-1,299	66.73	-429	10.5	7802	89%
PJM	AP_1_County_Harrison_G	8784	6,563	2,223	2,528	3,886	55.06	1,222	PJM	VAP_7_G	1879	4,179	303	-1,021	-1,772	65.53	-126	10.5	5619	64%
PJM	SOCO_15_MSA_Birmingham_G PENELEC_2_MSA_DuBois_G	8623 8404	12,464 2,724	9,217 1,196	1,611 821	4,984 1,658	54.34 56.52		FRCC PJM	FPL_2_MSA_FortMyers_G PL 7 MSA Allentown L	8513 8784	5,929 245	4,563 1.051	-1,058 -643	-2,545 -1.025	64.81 66.98	-584 -378	10.5 10.5	5046 7873	57% 90%
PJM	PJM500 3 MSA Pittsburgh G	8784	1,705	1,190	1.358	1,700	55.44	661		VAP 33 MSA DC L	8784	910	2,983	-1.729	-2.537	65.82	-999	10.5	7873	90%
	NEPOOL 5 SEMA	8784	6,454	3,978	1,703	3,589	72.03		NYPP	NYISO 11 NYK	8784	5,681	5,289	-1,729	-2,703	82.36	-1.407	10.4	8782	100%
	THE SOL O CLIVIA	5.04	0, 104	5,576	.,.00	0,000	. 2.00	.,570			0.04	0,001	5,205	.,040	2,. 50	02.00	.,.57	. 5.0	0102	100 /6

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub I	nformation								Sink Hub Info	rmation							10	Congestion	ndicators	$\overline{}$
Course ride ii	TOTAL COLO				Average				OHIN TIGO HITO	matori				Average				congodion	naioaioio	
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
Manier Anna	Hob Name	Source	Gen	Load	injection	injection	Price	surplus	Maniant A	High Manage	Sink	Gen	Load	injection	injection	Price	surplus	Price		1100.0/
Market Area	NYISO 8 NYH	Hours 8784	Weight 2,021	Weight 973	(MW) 1.581	(MW) 1.945	(\$/MWh) 77.04	(\$MM) 1.070	Market Area NEPOOL	Hub Name NEPOOL_7_CT	Hours 1106	Weight 4,447	Weight 3,920	(MW) -339	(MW) -1.095	(\$/MWh) 87.32	(\$MM) -33	Differential 10.3	U90 Hours 8753	U90 % 100%
	SOCO_28_MSA_Birmingham_G	8616	2,535	1.090	1,398	1,917	54.53	657	FRCC	FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	-584	10.3	5045	57%
NEPOOL	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637	NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	79.19	-527	10.3	8780	100%
NYPP	NYISO_6_NYF	7530	4,103	1,983	569	1,525	70.62	302		NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	10.3	8783	100%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,109	6,381	54.56	2,449	FRCC	FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	-584	10.2	5196	59%
P.JM	AB 4 County Hamises C	8784	6,563	2,223	2.528	3.886	55.06	1,222	DIM	AP_7_MSA_Hagerstown-	8784	203	1.153	-661	-1,009	65.25	-379	10.2	7540	000/
PJM	AP_1_County_Harrison_G PJM500 3 MSA Pittsburgh G	8784	1,705	2,223	1,358	1,700	55.44		PJM	Martinsburg_L VAP 27 MSA DC L	8784	203	1,153	-641	-1,009	65.61	-369	10.2	7518 7686	86% 88%
PJM	PJM500 7 MSA York-Hanover	8784	2,696	0	2,196	2,570	67.12	1,295		PECO 5 MSA Philadelphia L		1,656	2,510	-403	-2,442	77.26	-206	10.1	3504	40%
			_,,,,,			_,		.,		AEP_9_MSA_Canton-		.,			=,					
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0	2,119	2,290	37.75		PJM	Massillon_L	8784	733	2,120	-1,491	-2,063	47.87	-627	10.1	5526	63%
	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	1,885		FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	-584	10.1	5045	57%
PJM MISO	PJM500_3_MSA_Pittsburgh_G NIPS_8_MSA_Chicago_G	8784 8764	1,705 2,892	1,694	1,358 943	1,700 1,665	55.44 40.11	661 331	PJM PJM	VAP_7_G AEP_1_MSA_Lynchburg_G	1879 8784	4,179 843	303 2,162	-1,021 -1,538	-1,772 -2,299	65.53 50.18	-126 -678	10.1 10.1	6804 4780	77% 54%
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14		PJM	NI_6_MSA_Chicago_G	716	9,759	7,577	-1,336	-1,221	49.17	-070	10.1	5498	63%
MISO	NIPS 8 MSA Chicago G	8764	2,892	1,694	943	1,665	40.11			AEP 2 STA TN-WV L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	10.0	1408	16%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	606	1,085	38.13	199	MISO	XEL_3_MSA_Minneapolis_G	4678	7,596	7,622	-853	-2,814	48.01	-192	9.9	2351	27%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,474	1,700	56.21	728	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	66.07	-463	9.9	7887	90%
										AP_7_MSA_Hagerstown-										
PJM	PJM500_3_MSA_Pittsburgh_G	8784	1,705	0	1,358	1,700	55.44	661	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	65.25	-379	9.8	7816	89%
ENTERGY	EES 9 MSA Russellville G	2521	6,123	4,517	200	1,152	44.91	23	SOLITHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,297	-2,646	54.66	-623	9.7	3428	39%
LIVILIOI	LL3_9_W3A_Russellville_G	2021	0,120	4,017	200	1,102	44.51	20	COCITIENT	CCCC_TC_WCA_Attanta_E	0/04	054	5,000	1,201	2,040	34.00	023	3.7	3420	3376
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91	23	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	54.66	-878	9.7	3452	39%
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91	23	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	54.65	-511	9.7	3454	39%
ENITEDOV	550 0 MOA D           0	0504	0.400	4.547	200	4.450	44.04	00	COLITUEDN	COCO E OFN OFFICIAL	0704	0.000	0.400	4 000	0.000	54.04	000	0.7	0007	000/
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91	23	SOUTHERN	SOCO_5_GEN_GEPCHY_L SOCO_6_MSA_Augusta-	8784	2,098	3,403	-1,808	-2,983	54.64	-868	9.7	3387	39%
ENTERGY	EES 9 MSA Russellville G	2521	6,123	4,517	200	1,152	44.91	23	SOUTHERN	Richmond L	8784	0	1,187	-657	-1,116	54.61	-315	9.7	2899	33%
	220_0_M6/(_110000MM0_0		4,1.24	.,		.,							.,		.,				2000	- 0070
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91		SOUTHERN	SOCO_21_MSA_Atlanta_G	8768	3,334	2,733	-858	-1,940	54.60	-411	9.7	3379	38%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17		FRCC	FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	-584	9.6	5320	61%
MISO PJM	LGEE_3_GEN_Gehnt2_G	8784 8784	2,000	225	1,487	1,898	44.78 56.21		MISO PJM	LGEE_5_MSA_Lexington_L VAP 33 MSA DC L	8784 8784	595 910	2,345	-1,651 -1,729	-2,733	54.41 65.82	-789 -999	9.6	4107	47%
NEPOOL	PJM500_9_MSA_Pittsburgh_G NEPOOL 7 CT	7678	1,700 4,447	3,920	1,474 726	1,700 1,796	71.28		NYPP	NYISO 10 NYJ	8784	10.283	2,983 11,493	-3,846	-2,537 -5,293	80.87	-2,732	9.6 9.6	8041 8780	92% 100%
	SOCO_15_MSA_Birmingham_G	8623	12,464	9,217	1,611	4,984	54.34		FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1.476	-2,354	63.83	-827	9.5	4856	55%
				-,	,-	,						,	,		,					
PJM	BGE_7_MSA_Baltimore-Towson	8212	2,548	1,043	623	1,324	67.80		PJM	PECO_5_MSA_Philadelphia_L	6595	1,656	2,510	-403	-2,442	77.26	-206	9.5	4679	53%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,474	1,700	56.21		PJM	VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	65.61	-369	9.4	7633	87%
PJM	PJM500_9_MSA_Pittsburgh_G SOCO_28_MSA_Birmingham_G	8784 8616	1,700 2,535	1,090	1,474 1,398	1,700 1,917	56.21 54.53		PJM FRCC	VAP_7_G FPC_4_MSA_Tampa_L	1879 8784	4,179 2,239	303 2,873	-1,021 -1,476	-1,772 -2,354	65.53 63.83	-126 -827	9.3 9.3	7000 4859	80% 55%
SOUTHERN	SOCO_28_MSA_Birmingnam_G SOCO_26_MSA_Macon_G	8784	6,802	1,090	5,109	6,381	54.55		FRCC	FPC_4_MSA_Tampa_L FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,476	-2,354	63.83	-827	9.3	5011	57%
OOOTTILITAT	CCCC_ZC_WIGA_WIGCOII_C	0.01	0,002		0,100	0,001	01.00	2,110		11 0_1_W0/(_1ampa_2	0,0,	2,200	2,070	1,170	2,001	00.00	OL.	0.0	3011	01 70
SPP	AEPW_9_MSA_MountPleasant_	7978	8,168	3,832	800	1,815	50.17	320	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,952	-5,281	59.42	-1,541	9.2	8744	100%
PJM	PJM500_4_MSA_Philadelphia_0	8397	2,383	0	1,320	2,295	68.14		PJM	PECO_5_MSA_Philadelphia_L	6595	1,656	2,510	-403	-2,442	77.26	-206	9.1	5	0%
MISO	SOCO_31_MSA_Atlanta_G NIPS_8_MSA_Chicago_G	8771 8764	11,765 2,892	1,583 1,694	3,929 943	9,802 1,665	54.70 40.11	1,885	FRCC PJM	FPC_4_MSA_Tampa_L NI_6_MSA_Chicago_G	8784 716	2,239 9,759	2,873 7,577	-1,476 -320	-2,354 -1,221	63.83 49.17	-827 -11	9.1 9.1	4860 13	55% 0%
IVIIOO	NIFS_8_MSA_CIlicago_G	0704	2,032	1,034	343	1,003	40.11	331	r Jivi	AP_7_MSA_Hagerstown-	710	3,733	1,511	-320	-1,221	43.17	-11	3.1	13	076
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,474	1,700	56.21	728	PJM	Martinsburg_L	8784	203	1,153	-661	-1,009	65.25	-379	9.0	7880	90%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,860	2,732	65.41	1,069	NYPP	NYISO_7_NYG	8388	3,156	2,195	-698	-1,444	74.41	-436	9.0	5975	68%
ENTERGY MISO	EES_9_MSA_Russellville_G	2521 8784	6,123 2,000	4,517 225	200 1,487	1,152 1,898	44.91 44.78	23 585		SOCO_17_MSA_Mobile_G TVA 5 MSA Nashville L	6738 8531	5,205 9,154	4,575 8,858	-421 -1,542	-1,892 -4,313	53.83 53.67	-153 -706	8.9 8.9	3389	39%
SOUTHERN	LGEE_3_GEN_Gehnt2_G SOCO 17 MSA Mobile G	2046	5,205	4,575	1,487	1,898	58.33		FRCC	FPL 7 MSA Miami L	8531 8784	9,154 570	3,923	-1,542 -2,488	-4,313 -4,070	67.21	-1,469	8.9 8.9	6303 5740	72% 65%
SSOTTILININ	OCCO_17_WGA_WGDIIE_G	2040	3,203	+,573	214	1,100	30.33	20		EES 7 MSA Beaumont-	0704	310	3,323	2,400	+,070	31.21	1,409	0.9	3740	05%
ENTERGY	EES_9_MSA_Russellville_G	2521	6,123	4,517	200	1,152	44.91	23	ENTERGY	PortArthur_G	7005	7,393	4,949	-489	-1,659	53.78	-184	8.9	6572	75%
NEPOOL	NEPOOL_5_SEMA	8784	6,454	3,978	1,703	3,589	72.03	1,078	NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	8.8	8781	100%
	NYISO_3_NYC	8784	6,711	2,657	1,860	2,732	65.41			NEPOOL_9_NWKST	8784	405	1,524	-696	-1,248	74.26	-454	8.8	8771	100%
	SOCO_17_MSA_Mobile_G	2046 2521	5,205 6,123	4,575 4,517	214 200	1,180 1,152	58.33 44.91			FPL_3_MSA_Miami_L TVA 5 MSA Nashville L	8784 8531	6,944 9,154	7,089 8,858	-1,934 -1,542	-4,084 -4,313	67.15 53.67	-1,141 -706	8.8 8.8	5381	61%
ENTERGY	EES_9_MSA_Russellville_G	∠521	6,123	4,517	∠00	1,152	44.91	23	IVAUIHUR	AEP_9_MSA_Canton-	8531	9,154	8,858	-1,542	-4,313	53.67	-706	8.8	6019	69%
MISO	AMRN_12_MSA_StLouis_L	6698	5.059	6,066	757	1,937	39.14	198	PJM	Massillon L	8784	733	2,120	-1,491	-2,063	47.87	-627	8.7	5990	68%
	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17		FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,476	-2,354	63.83	-827	8.7	5162	59%
				·																
SPP	AEPW_5_MSA_Tulsa_G	7478	4,226	2,571	420	1,245	51.57		SPP	WERE_4_GEN_Wolfcreek_G	3670	3,510	2,459	-486	-1,564	60.17	-107	8.6	4615	53%
NYPP VACAR	NYISO_6_NYF	7530	4,103	1,983	569	1,525	70.62		NYPP	NYISO_9_NYI VAP 33 MSA DC L	8467	2	1,476	-786	-1,993	79.19	-527	8.6 8.4	8657	99%
VACAR VACAR	CPLE_1_MSA_Durham_G CPLE_1_MSA_Durham_G	7851 7851	10,224 10,224	8,563 8,563	1,043 1,043	2,644 2,644	57.38 57.38		PJM PJM	VAP_33_MSA_DC_L VAP_27_MSA_DC_L	8784 8784	910	2,983 1.048	-1,729 -641	-2,537 -1.075	65.82 65.61	-999 -369	8.4 8.2	7483 7123	85% 81%
MISO	BREC 3 County Webster G	8784	1,355	476	906	1,164	37.08			LGEE 9 MSA Louisville G	8784 8784	1,136	1,048	-641 -959	-1,756	45.30	-382	8.2	7123	81% 83%
	EES 9 MSA Russellville G	2521	6,123	4,517	200	1,152	44.91			EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,220	-1,970	53.10	-569	8.2	2739	31%
			3, .20	.,0.77	230	.,.52					0.04	٥,٢.٥	3,000	.,0	.,0.0	300	000	0.2	2100	01/0

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source   Hub Information   Sink Hub Information   Max net Information   Sink Hub Information   Sink Hub Information   Max net Information   Sink Hub Information   Average Information   Average Information	Average Price (\$/MWh) 43.77 65.53 50.18 50.08 50.19 50.08 59.42 47.87 62.09	Revenue surplus (\$MM) -276 -126 -678 -684 -678 -527 -684 -1,541 -627 -1,013	Price Differential 8.2 8.2 8.1 8.0 7.9 7.9	U90 Hours 5642 5425 5514 2451 5524 8633 2458	U90 % 64% 62% 63% 28% 63% 2888 88%
Market Area   Hub Name   Hours   Weight   Weight   Weight   Weight   Weight   Market Area   Hub Name   Hours   Weight   Weight   Market Area   Hub Name   Hours   Weight   Weight   Market Area   Hub Name   Hours   Hub Name	Price (\$/MWh) 43.77 65.53 50.18 50.08 50.18 79.19 50.08 59.42 47.87 62.09	surplus (\$MM) -276 -126 -678 -684 -678 -527 -684 -1,541	8.2 8.2 8.1 8.0 8.0 7.9 7.9	5642 5425 5514 2451 5524 8633 2458	64% 62% 63% 28% 63% 98% 28%
Market Area   Hub Name   Hours   Weight   Weight   MW)   MWW   Market Area   Hub Name   Hours   Weight   Meight   MWW   MWW   Market Area   Hub Name   Hours   Weight   Meight   Meig	(\$/MWh) 43.77 65.53 50.18 50.08 50.18 79.19 50.08 59.42 47.87 62.09	(\$MM) -276 -126 -678 -684 -678 -527 -684 -1,541	8.2 8.2 8.1 8.0 8.0 7.9 7.9	5642 5425 5514 2451 5524 8633 2458	64% 62% 63% 28% 63% 98% 28%
PJM NI_15_MSA_Davenport_G 8664 2.479 0 1.716 2.314 35.62 530 MISO AMRN_2_County_Macon_L 8784 174 1.209 -717 -1,139 VACAR CPLE_1_MSA_Durham_G 7851 10.224 8,563 1,043 2.644 57.38 470 PJM VAP_7_G 1879 4,179 303 -1,021 -1,772 PJM NI_2_MSA_Chicago_G 8784 5.342 1.283 3.495 4,144 42.11 1,293 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,264 PJM NI_2_MSA_Chicago_G 8784 5.342 1.283 3.495 4,144 42.11 1,293 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,640 PJM NI_2_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 843 2,162 -1,538 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 8,42 -1,538 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 8,42 -1,635 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1,284 2,977 -1,555 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1,284 2,977 -1,555 -2,640 PJM NI_6_MSA_Chicago_G 8068 9,759 7,577 994 2,629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1,284 2,977 -1,555 -2,640 PJM NI_6_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 PJM Massillon_L 8784 733 2,120 -1,491 -2,063 SOUTHERN_SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC_3_MSA_Chaloo_L 8784 1,232 3,649 -1,857 -3,553 SOUTHERN_SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC_3_MSA_Chaloo_L 8784 1,232 3,649 -1,857 -3,553 SOUTHERN_SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC_3_MSA_Chaloo_L 8784 1,232 3,649 -1,857 -3,553 SOUTHERN_SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC_3_MS	43.77 65.53 50.18 50.08 50.18 79.19 50.08 59.42 47.87 62.09	-276 -126 -678 -684 -678 -527 -684 -1,541	8.2 8.2 8.1 8.0 8.0 7.9 7.9	5642 5425 5514 2451 5524 8633 2458	64% 62% 63% 28% 63% 98% 28%
VACAR         CPLE 1 MSA Durham G         7851         10.224         8.563         1.043         2.644         57.38         470 PJM         VAP.7 G         1879         4,179         303         -1,021         -1,772           PJM         NI 2 MSA Chicago G         8784         5,342         1,283         3,495         4,144         42.11         1,239 PJM         AEP 1 MSA Lynchburg G         8784         43         2,162         -1,555         -2,640           PJM         NI 2 MSA Chicago G         8784         5,342         1,283         3,495         4,144         42.11         1,239 PJM         AEP 2 STA TN-WV L         8784         1,284         2,977         -1,555         -2,640           PJM         NI 2 MSA Chicago G         8068         9,759         7,577         994         2,629         42.22         339 PJM         AEP 1 MSA Lynchburg G         8784         843         2,162         -1,538         -2,299           PJM         NI E MSA Chicago G         8068         9,759         7,577         994         2,629         42.22         339 PJM         AEP 1 MSA Lynchburg G         8784         843         2,162         -1,538         -2,299           PJM         NI E MSA Chicago G         8068         9,	65.53 50.18 50.08 50.18 79.19 50.08 59.42 47.87 62.09	-126 -678 -684 -678 -527 -684 -1,541	8.2 8.1 8.0 8.0 7.9 7.9	5425 5514 2451 5524 8633 2458	62% 63% 28% 63% 98% 28%
PJM   NI_2_MSA_Chicago G   8784   5,342   1,283   3,498   4,144   42.11   1,293 PJM   AEP_1_MSA_Lynchburg G   8784   843   2,162   -1,538   -2,299 PJM   NI_2_MSA_Chicago G   8784   5,342   1,283   3,498   4,144   42.11   1,293 PJM   AEP_1_MSA_Lynchburg G   8784   1,284   2,977   -1,555   -2,640 PJM   NI_6_MSA_Chicago G   8068   9,759   7,577   994   2,629   42.22   339 PJM   AEP_1_MSA_Lynchburg G   8784   843   2,162   -1,538   -2,640 PJM   NI_6_MSA_Chicago G   8068   9,759   7,577   994   2,629   42.22   339 PJM   AEP_1_MSA_Lynchburg G   8784   843   2,162   -1,558   -2,640 PJM   NI_6_MSA_Chicago G   8068   9,759   7,577   994   2,629   42.22   339 PJM   AEP_1_MSA_Lynchburg G   8784   843   2,162   -1,558   -2,640 PJM   NI_6_MSA_Chicago G   8068   9,759   7,577   994   2,629   42.22   339 PJM   AEP_2_STA_TN-Wy_L   8784   1,284   2,977   -1,555   -2,640 PJM   NI_6_MSA_Chicago G   8068   9,759   7,577   994   2,629   42.22   339 PJM   AEP_2_STA_TN-Wy_L   8784   1,284   2,977   -1,555   -2,640 PJM   NI_6_MSA_Tulsa G   7478   4,226   2,571   420   1,245   51.57   162 ENTERGY   EES_6_MSA_NewOrleans_G   8784   9,735   9,294   -2,952   -5,281   NISO   NIPS_8_MSA_Chicago G   8764   2,892   1,694   943   1,665   40.11   331 PJM   Massillon_L   8784   733   2,120   -1,491   -2,063   SOUTHERN   SOCO_15_MSA_Birmingham_G   8623   12,464   9,217   1,611   4,984   54.34   755 FRCC   FPC_3_MSA_Orlando_L   8784   1,232   3,649   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,857   -3,553   -2,640   -1,8	50.18 50.08 50.18 79.19 50.08 59.42 47.87 62.09	-678 -684 -678 -527 -684 -1,541	8.1 8.0 8.0 7.9 7.9	5514 2451 5524 8633 2458	63% 28% 63% 98% 28%
PJM   NI_2 MSA_Chicago G   8784   5.342   1.283   3.495   4.144   42.11   1.293 PJM   AEP_2 STA_TN-WV_L   8784   1.284   2.977   -1.555   -2.640	50.08 50.18 79.19 50.08 59.42 47.87 62.09	-684 -678 -527 -684 -1,541	8.0 8.0 7.9 7.9	2451 5524 8633 2458	28% 63% 98% 28%
PJM NI_6_MSA_Chicago_G 8068 9.759 7.577 994 2.629 42.22 339 PJM AEP_1_MSA_Lynchburg_G 8784 843 2.162 -1,538 -2,299 NEPOOL_7_CT 7678 4.447 3.920 726 1.796 71.28 397 NYPP NYISO_9_NYI 8467 2 1.476 7-786 1.993 PJM NI_6_MSA_Chicago_G 8068 9.759 7.577 994 2.629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1.284 2.977 -1.555 -2,640 PJM NI_6_MSA_Chicago_G 8068 9.759 7.577 994 2.629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1.284 2.977 -1.555 -2,640 PJM NI_6_MSA_Chicago_G 8068 9.759 7.577 994 2.629 42.22 339 PJM AEP_2_STA_TN-WV_L 8784 1.284 2.977 -1.555 -2,640 PJM NI_6_MSA_Tulsa_G 7478 4.226 2.571 420 1.245 51.57 162 ENTERGY EES_5_MSA_NewOrleans_G 8784 9.735 9.294 -2.952 -5.281 PJM NISO_NIPS_8_MSA_Chicago_G 8764 2.892 1.694 943 1.665 40.11 331 PJM Massillon_L 8784 733 2.120 -1,491 -2.063 SOUTHERN_SOCO_15_MSA_Birmingham_G 8623 12.464 9.217 1.611 4.984 54.34 755 FRCC FPC_3_MSA_Orlando_L 8784 1.232 3.649 -1.857 -3.553	50.18 79.19 50.08 59.42 47.87 62.09	-678 -527 -684 -1,541 -627	8.0 7.9 7.9 7.9	5524 8633 2458	63% 98% 28%
PJM         NI_6_MSA_Chicago_G         8068         9,759         7,577         994         2,629         42.22         339 PJM         AEP_2_STA_TN-WV_L         8784         1,284         2,977         -1,555         -2,640           SPP         AEPW_5_MSA_Tulsa_G         7478         4,226         2,571         420         1,245         51.57         162 ENTERGY         EES_5_MSA_NewOrleans_G         8784         9,735         9,294         -2,952         -5,281           MISO         NIPS_8_MSA_Chicago_G         8764         2,892         1,694         943         1,665         40.11         331 PJM         Massillon_L         8784         733         2,120         -1,491         -2,063           SOUTHERN         SOCO_15_MSA_Birmingham_G         8623         12,464         9,217         1,611         4,984         54.34         755 FRCC         FPC_3_MSA_Orlando_L         8784         1,232         3,649         -1,857         -3,553	50.08 59.42 47.87 62.09	-684 -1,541 -627	7.9	2458	28%
SPP         AEPW_5_MSA_Tulsa_G         7478         4,226         2,571         420         1,245         51.57         162 ENTERGY         EES_5_MSA_NewOrleans_G         8784         9,735         9,294         -2,952         -5,281           MISO         NIPS_8_MSA_Chicago_G         8764         2,892         1,694         943         1,665         40.11         331 PJM         Massillon_L         8784         733         2,120         -1,491         -2,063           SOUTHERN         SOCO_15_MSA_Birmingham_G         8623         12,464         9,217         1,611         4,984         54,34         755 FRCC         FPC_3_MSA_Orlando_L         8784         1,232         3,649         -1,857         -3,553	59.42 47.87 62.09	-1,541 -627	7.9		
MISO NIPS 8 MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 PJM Massillon_L 8784 733 2,120 -1,491 -2,063 SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 75S FRCC FPC_3_MSA_Orlando_L 8784 1,232 3,649 -1,857 -3,553	47.87 62.09	-627		7692	88%
MISO NIPS 8 MSA Chicago G 8764 2,892 1,694 943 1,665 40.11 331 PJM Massillon L 8784 733 2,120 -1,491 -2,063 SOUTHERN SOCO 15 MSA Birmingham G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC 3 MSA Orlando L 8784 1,232 3,649 -1,857 -3,553	47.87 62.09	-627		7692	88%
MISO NIPS 8_MSA_Chicago_G 8764 2.892 1.694 943 1.665 40.11 331 PJM Massillon_L 8784 733 2.120 -1.491 -2.063 SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12.464 9.217 1.611 4.984 54.34 755 FRCC FPC_3_MSA_Orlando_L 8784 1.232 3.649 -1.857 -3.553	62.09		7.8		5576
SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 FRCC FPC_3_MSA_Orlando_L 8784 1,232 3,649 -1,857 -3,553	62.09			1446	16%
		.,,	7.8	4315	49%
Transport - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	54.66			1010	1070
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 SOUTHERN SOCO_16_MSA_Atlanta_L 8784 694 3,058 -1,297 -2,646		-623	7.6	5488	62%
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 SOUTHERN SOCO_33_MSA_Atlanta_L 8784 3 3,305 -1,828 -3,110	54.66	-878	7.6	5495	63%
TVAUTHOR TVA 4 MSA Clarksville G 8616 2.544 150 2.096 2.473 47.01 849 SOUTHERN SOCO 8 MSA Atlanta L 8784 0 1.925 -1.065 -1.811	54.65	544	7.0	5500	
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2.544 150 2.096 2.473 47.01 849 SOUTHERN SOCO_8_MSA_Atlanta_L 8784 0 1,925 -1,065 -1,811	54.65	-511	7.6	5502	63%
TVAUTHOR TVA_4_MSA_Clarksville G 8616 2.544 150 2.096 2.473 47.01 849 SOUTHERN SOCO_5_GEN_GEPCHY_L 8784 2.098 3.403 -1,808 -2,983	54.64	-868	7.6	5423	62%
SOCO_6 MSA_Augusta-	0 1.0 1		1.0	0420	0270
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 SOUTHERN Richmond_L 8784 0 1,187 -657 -1,116	54.61	-315	7.6	5434	62%
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 SOUTHERN  SOCO_21_MSA_Atlanta_G 8768 3,334 2,733 -858 -1,940	54.60	-411	7.6	5468	62%
SOUTHERN SOCO_28_MSA_Birmingham_G 8616 2,535 1,090 1,398 1,917 54.53 657 FRCC FPC_3_MSA_Orlando_L 8784 1,232 3,649 -1,857 -3,553	62.09	-1,013	7.6	4316	49%
SOUTHERN SOCO_26_MSA_Macon_G 8784 6,802 0 5,109 6,381 54.56 2,449 FRCC FPC_3_MSA_Orlando_L 8784 1,232 3,649 -1,857 -3,553	62.09	-1,013	7.5	4497	51%
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 MISO LGEE_5_MSA_Lexington_L 8784 595 2,345 -1,651 -2,733	54.41	-789	7.4	5249	60%
SOUTHERN SOCO_31_MSA_Atlanta_G 8771 11,765 1,583 3,929 9,802 54.70 1,885 FRCC FPC_3_MSA_Orlando_L 8784 1,232 3,649 -1,857 -3,553	62.09	-1,013	7.4	4313	49%
MISO AMRN_12_MSA_SILouis_L 6698 5,059 6,066 757 1,937 39.14 198 MISO CIN_1_MSA_Indianapolis_L 8784 816 4,274 -2,181 -3,310 PJM NJ 20_MSA_Chicago_G 7224 1,632 83 890 1,513 42.90 276 PJM AEP 1 MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,299	46.47 50.18	-890 -678	7.3 7.3	5961 5407	68%
PJM NI_20_MSA_Chicago_G 7224 1,632 83 890 1,513 42.90 276 PJM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,299 NYPP NYISO_1_NYA 8272 4,946 2,500 1,598 2,466 50.73 671 NEPOOL 2 NH 265 4,204 2,621 -181 -1,019	57.99	-0/0	7.3	6795	62% 77%
1017   10170   10171   10171   10172   10171	50.08	-684	7.2	4430	50%
NEPOOL NEPOOL 5 SEMA 8784 6,454 3,978 1,703 3,589 72.03 1,078 NYPP NYISO 9 NYI 8467 2 1,476 -786 -1,993	79.19	-527	7.2	8648	98%
ONTARIO IESO 6 G 8784 2,146 147 1,844 2,071 47.25 765 NYPP NYISO 6 NYF 1254 4,103 1,983 -261 -1,145	54.41	-18	7.2	6643	76%
ONTARIO IESO_7_G 8784 2,953 253 2,502 2,825 47.25 1,039 NYPP NYISO_6_NYF 1254 4,103 1,983 -261 -1,145	54.41	-18	7.2	6644	76%
ONTARIO IESO_15_G 8385 1,964 3,375 1,097 2,054 47.28 435 NYPP NYISO_6_NYF 1254 4,103 1,983 -261 -1,145	54.41	-18	7.1	6638	76%
PJM AP_1_County_Harrison_G 8784 6,563 2,223 2,528 3,886 55.06 1,222 PJM VAP_15_MSA_VB-Norfolk_L 8784 435 1,297 -594 -1,149	62.16	-324	7.1	7565	86%
PJM NI_2_MSA_Chicago_G 8784 5,342 1,283 3,495 4,144 42.11 1,293 PJM NI_6_MSA_Chicago_G 716 9,759 7,577 -320 -1,221	49.17	-11	7.1	0	0%
ENTERGY EES 9 MSA Russellville G 2521 6.123 4.517 200 1.152 44.91 SIGOUTHERN G 1396 3.574 2.674 2.58 -1.156	51.96	-19	7.0	0400	000/
	51.96	-549	7.0	3198	36%
MISO   LGEE_3_GEN_Gehnt2_G   8784   2,000   225   1,487   1,898   44.78   585 TVAUTHOR   TVA_3_MSA_Knoxville_L   8784   3,684   5,102   -1,206   -2,885   SOUTHERN   SOCO_32_MSA_Pascagoula_G   7388   3,574   2,674   452   1,568   55.17   184 FRCC   FPC_3_MSA_Orlando_L   8784   1,232   3,649   -1,857   -3,553   -3,55	62.09	-1.013	6.9	4977 4761	57% 54%
ENTERGY   EES 9 MSA Russellville G 2521 6,123 4,517 200 1,135 44.91 23TVAUTHOR   TVA_3 MSA Knoxville L 8784 3,684 5,102 1,206 -2,885	51.80	-549	6.9	3400	39%
MISO LGEE_3_GEN_Gehnt2_G 8784 2,000 225 1,487 1,898 44.78 588]TVAUTHOR [TVA_7_MSA_Memphis_L 8769 7,215 5,982 -1,527] -4,177	51.66	-692	6.9	5112	58%
NYPP NYISO 3 NYC 8784 6,711 2,657 1,860 2,732 65.41 1,069 NEPOOL NEPOOL 6 WCMA 8762 4,285 3,417 -1,506 3,982	72.25	-953	6.8	8320	95%
TVAUTHOR TVA_4_MSA_Clarksville_G 8616 2,544 150 2,096 2,473 47.01 849 SOUTHERN SOCO_17_MSA_Mobile_G 6738 5,205 4,575 -421 -1,892	53.83	-153	6.8	5863	67%
PJM NI_15_MSA_Davenport_G 8664 2,479 0 1,716 2,314 35.62 530 PJM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115	42.40	-2,006	6.8	4747	54%
ENTERGY EES_9_MSA_Russellville_G 2521 6,123 4,517 200 1,152 44,91 23 TVAUTHOR_TVA_7_MSA_Memphis_L 8769 7,215 5,982 -1,527 -4,177	51.66	-692	6.8	960	11%
PJM NI_15_MSA_Davenport_G 8664 2,479 0 1,716 2,314 35.62 530 PJM NI_3_MSA_Chicago_L 8784 26 1,205 634 -1,254	42.36	-236	6.7	4745	54%
PJM PJM500_3_MSA_Pittsburgh_G 8784 1,705 0 1,358 1,700 55.44 661 PJM VAP_15_MSA_VB-Norfolk_L 8784 435 1,297 -594 -1,149 SPP WERE 1 MSA Manhattan G 8753 2,988 409 1,357 2,215 39.31 467 SPP AEPW 1 MSA Tulsa G 7440 3,295 2,000 -608 -1,182	62.16 45.99	-324 -208	6.7	7717 8644	88% 98%
SPP WERE_IMSA_Walfinitiatin_G 6753 2,968 409 1,357 (2,215) 39.31 407 SPP REFW_IMSA_UBS_5 7440 3,259 2,000 -008 -1,152 TVAUTHOR TVA_4_MSA_Clarksville G 8616 2,544 150 2,965 2,473 4.701 849 TVAUTHOR TVA_5_MSA_Nashville_L 8531 9,154 8,858 1-5,422 -4,313	53.67	-208	6.7	5959	68%
1740 HOVED 1742 - MISPA Claristrine 3 0010 2,594 130 2,994 130 2,793 47.01 049 1740 HOVED 1740 1750 1740 1750 1750 1750 1750 1750 1750 1750 175	72.00	-706	6.6	8770	100%
TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,096 2,473 47.01 849[NTERGY [EES 9 MSA Russellville G 6263 6,123 4,517] -444 -1,617	53.58	-149	6.6	5847	67%
SOUTHERN SOCO_17_MSA_Mobile_G 2046 5,205 4,575 214 1,180 58.33 26 FRCC FPL_2_MSA_FortMyers_G 8513 5,929 4,563 -1,058 -2,545	64.81	-584	6.5	5068	58%
NEPOOL NEPOOL_3_ME 4348 3,494 2,522 361 1,212 67.94 107 NYPP NYISO_7_NYG 8388 3,156 2,195 698 1,444	74.41	-436	6.5	6499	74%
MISO WEC_1_MSA_Chicago_G 8784 1,728 303 896 1,134 35.99 283 PJM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115	42.40	-2,006	6.4	4466	51%
MISO WEC_1_MSA_Chicago_G 8784 1,728 303 896 1,134 35.99 283 PJM NI_3_MSA_Chicago_L 8784 26 1,205 634 -1,254	42.36	-236	6.4	4466	51%
MISO NIPS_8_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_1_MSA_Indianapolis_L 8784 816 4,274 -2,181 -3,310 NEPOOL NEPOOL 3 ME 4348 3,494 2,522 361 1,212 67.94 107 NEPOOL NEPOOL 9 NWKST 8784 405 1,524 -696 -1,248	46.47	-890 -454	6.4	1302	15%
	74.26 49.17	-454 -11	6.3	8768	100%
PJM         NI_20_MSA_Chicago_G         7224         1,632         83         890         1,513         42.90         276 PJM         NI_6_MSA_Chicago_G         716         9,759         7,577         -320         -1,221           MISO         IP 8 GEN Clinton G         8015         2,302         1,195         913         1,230         42.92         314 PJM         NI_6_MSA_Chicago_G         716         9,759         7,577         -320         -1,221	49.17	-11 -11	6.3	0 175	0% 2%
MISO IP_6_GEN_Climon_G 6019 2,302 1,199 919 1,250 42.92 314F0M IN_6_MSA_Climago_G 710 9,799 7,377 -320 -1,221 SCC_0.10 MSA_Albany-	45.17	-11	0.3	1/5	∠%
TVAUTHOR TVA 1 MSA Chatt-Hunts G 8782 17,334 9,966 3,215 6,406 52.50 1,482 SOUTHERN Valdosta L 7471 3,431 4,125 -662 -2,746	58.74	-290	6.2	112	1%
MISO   EKPC 8 MSA Maysville_G 8784 1,396 272 936 1,366 48.33 397MISO   LOEE_5_MSA_Lexington_L 8784 595 2,345 -1,651 -2,733	54.41	-789	6.1	1318	15%
PJM   NI 7 MSA Rochelle G   8784   2,290   0 2,119   2,290   37.75   703   MISO   AMRN_2 County_Macon_U   8784   174   1,209   -717   -1,139	43.77	-276	6.0	5606	64%
ENTERGY   EES_8_MSA_BatonRouge_G   8520   1,060   0   1,059   1,060   53.42   482   ENTERGY   EES_5_MSA_NewOrleans_G   8784   9,735   9,294   -2,952   -5,281	59.42	-1,541	6.0	5115	58%
PJM PJM500_9_MSA_Pittsburgh_G 8784 1,700 0 1,474 1,700 56.21 728 PJM VAP_15_MSA_VB-Norfolk_L 8784 435 1,297 -594 -1,149	62.16	-324	5.9	7791	89%
PJM DLCO_7_MSA_Pittsburgh_G 8616 1,644 25 1,310 1,633 46.28 522 MISO FE_5_MSA_Cleveland_L 6258 3,216 4,680 -514 -2,089	52.20	-168	5.9	4548	52%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

	Source Hub Ir	formation								Sink Hub Info	rmation							-	Congestion	ndicators	
Proceedings   Proceeding   Pr	Source Hub II	ioiniation				Average				Silik Hub illic	imation				Average				Congestion	Tidicators	
March Reference   March Register   Mar															net						
PRINCE   1001																					
PM	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
PM	ENTERGY	LAGN 1 MSA BatonRouge G	8784	2,199	163	1,343	1,701	53.52	631	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2.952	-5.281	59.42	-1.541	5.9	6328	72%
### Carp Collect (Sept. 1)					6,544			48.54									54.41		5.9		0%
BECK   Company					0																55%
## PROPERTY COLOR (1997)   1.500   1.5																					41%
STITEMENT   ACCUSATION   ACCU						, .															51% 56%
1850 - F. 3 MARA Translates G. 1964 1.500 1.71 1.200 1.800 1.71 1.200 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.800 1.700 1.700 1.700 1.700 1.800 1.700 1.																					55%
BEST   Proc.																					2%
PM	MISO		8610	1,860		1,265		46.43	506	MISO	FE_5_MSA_Cleveland_L	6258	3,216		-514	-2,089	52.20	-168	5.8	3808	43%
### SPIESON ACC., ACEN, Interface of the Computer of the Compu																					
March   Marc																					28%
PAM   A.P. R. & M.R.A. Cheego, G.   8006   370   7.577   894   2629   4.22   2080   Malestine, L.   8704   731   2.120   1.491   2.000   4.787   4.787   2.551   5.55   5.557   5.558   5.55	ENTERGY	AECI_4_GEN_NewMadrid1_G	8/81	2,315	248	1,151	1,615	47.88	484	ENTERGY		6263	6,123	4,517	-444	-1,617	53.58	-149	5.7	4595	52%
EMT (1974) 1875 (1974) 1876 (1	PJM	NI 6 MSA Chicago G	8068	9.759	7.577	994	2.629	42.22	339	PJM		8784	733	2.120	-1.491	-2.063	47.87	-627	5.6	2490	28%
ENTERON   SECTION   MAIN A VANISHING   Section   Secti			8782			5,935	10,177	48.54	2,530	VACAR	DUK_4_MSA_Greenville_L		3,546	4,489	-589	-1,925			5.6		59%
SOUTHERN SOCK PLANS, AND SOCK ASSOCIATION STATE AND SOCIATION SOCI																					
NEPOCO, REPOCO, 2, Nat. Sept. 40, 500 779 10, 500 10,																					72%
MSD   SEPCE & REAL Mayorate   G   First   1,388   212   398   1,398   43.3   397 TVAUTIOR   TV.S. D. MAC National   1,500																					55%
NEPOL (NEPOL 2 IN)   5818   4,000   2,527   738																					81% 64%
NPSP NYSS B, NYS B R																					100%
FRCC PEA GMSA Alisoscovinias G 8784 1.865 858 860 1.336 62.05 4489 PRCC PF_2_MA Apr 6_6 547 6384 4.070 67.27 1.468 5.0 6397 1.077 4.070 6.7 67.27 1.468 5.0 6397 1.077 4.071 1.070 1			8784	2,021	973	1,581		77.04	1,070			8784	5,681	5,289	-1,945		82.36	-1,407	5.3		100%
PAM   APP 6 CEN Amount G   6782   18,694   6,544   5,593   601,774   46,54   2,580   7,704   6,504   7,706   7,504   7,706   7,504   7,706		LGEE_3_GEN_Gehnt2_G																			47%
FRCC IFA, MSA, Justonomies, G. 1794 1,565 366 909 1,349 62.05 469 FRCC IFF, S.MSA, Morroll, 1976 6,344 7,089 1,359 4,4684 6715 1,141 5,1 4436 SOUTHERN SOCO 16 MSA, Birmingham, G. 805 12,466 9,175 1,141 5,1 4436 SOUTHERN SOCO 16 MSA, Birmingham, G. 805 12,466 9,175 1,141 5,1 4436 SOUTHERN SOCO 16 MSA, Birmingham, G. 807 1,256 1,257 1,258 1,2				.,			.,														50%
SOUTHERN SCOOL 15 MSA Bimmigham @ 8603 12.464 9.217 1.611 4.694 54.34 756 ENTERGY EES 5.MSA NewOrleans @ 8754 9.735 9.294 2.555 6.281 6.90 1.541 6.91 6.90 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	. 0.00																				68%
FMC   FPC   MSA Homosassasping   FPA   1,584   6,017   1,527   1,538   6,018   1,019   70,018   1,014   6,007   4,018   5,19   5,271   1,771   1,585   6,19   1,521	FRUU	JEA_6_MSA_Jacksonville_G	8784	1,000	358	908	1,349	62.05	495	FRUU	FPL_3_WSA_MIAMI_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	5.1	4438	51%
FMC   FPC   MSA Homosassasping   FPA   1,584   6,017   1,527   1,538   6,018   1,019   70,018   1,014   6,007   4,018   5,19   5,271   7,718   7,718   7,271   1,018	SOUTHERN	SOCO 15 MSA Birmingham G	8623	12.464	9.217	1.611	4.984	54.34	755	ENTERGY	EES 5 MSA NewOrleans G	8784	9.735	9.294	-2.952	-5.281	59.42	-1.541	5.1	6967	79%
FRCC FPC, 2 MSA HomosassSpring F784 1,598 0 1,421 1,584 E219 778 FRCC FPC, MSA, Cardion F784 570 3,322 2,488 4,070 67.21 1,468 5.0 5218 FM Mossibor 1, 1,449 2,000 4,475 4,675													0								60%
PM N. 120, MSA, Chicago, G. 7224 1, 1632 83 890 1, 1513 4, 2.00 276 PM Messillon, L. 773 773 2, 120 1, 1491 2, 063 4, 774 4, 27 2, 28 5, 41 1, 169 PM PS 1970 3, NYC 678 4, 1584 0, 14, 21 1, 1584 62, 19 2, 776 PKCC FPC, 2, MSA, Menyork, G. 6784 6, 544 1, 172 1, 24, 24 70, 38 4, 68 5, 174 1, 14, 14 5, 10 5, 121 1, 141 1, 159 PM PS 180 2, 144 1, 158 1,	FRCC		8784	1,584	0	1,421	1,584	62.19	776	FRCC		8784	570	3,923	-2,488	-4,070	67.21	-1,469	5.0		59%
NYPP   NYISO 3. NYC   8784   6.711   2.657   1.865   2.732   65.41   1.068 PAM   PSEC.8, MSA, NewYork, G   8784   3.860   3.654   1.121   2.462   70.38   46.93   5.01   7706																					
FRCC FPC_Z_MSA_HomosassaSpring 8784 1,584 0 1,421 1,584 c2.19 778 FRCC FPL_3_MSA_Mism_L 8784 6,944 7,089 1,1934 4,058 67.15 1,114 5.0 5.0 5.14 170 170 170 170 170 170 170 170 170 170																					28%
TAJUTIOR ITVA, 4, MSA, Clarksville, G					2,657	.,							0,000	-,							88% 59%
ENTERGY EES, 10, MSA, Vicksburg, G 8664 2,478 0 1,716 2,314 35.62 530 MISO WEC, 3, MSA, Milwaukee, G 6881 1,429 2,423 -261 -1,101 40.53 -73 4.9 4104 ENTERGY EES, 10, MSA, Vicksburg, G 8080 3,544 1,249 867 1,221 53.84 377 SOUTHERN Valdods, L.A. Albary.  SOUTHERN SOCO 28, MSA, Birmingham, G 8616 2,555 1,000 1,396 1,917 54.53 657 ENTERGY EES, 5, MSA, NewOrleans, G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,541 4.9 6052					150																67%
ENTERGY ES 10 MSA Vicksburg G 8088 3.544 1.249 867 1.221 53.84 377 SOUTHERN Valodstal L. 7471 3.431 4.125 -662 -2.746 58.74 -290 4.9 1223 SOUTHERN SOCO 28 MSA Birmingham G 8616 2.535 1.090 1.398 1.917 54.53 667 ENTERGY ES 5. MSA NewOrleans G 8764 9.736 9.294 -2.962 -5.281 59.42 -1.541 4.9 6923 SOUTHERN SOCO 26 MSA Macon G 8784 6.802 0 5.103 6.381 54.56 2.448 ENTERGY ES 5. MSA NewOrleans G 8764 9.735 9.294 -2.962 -5.281 59.42 -1.541 4.9 6923 SOUTHERN SOCO 26 MSA Macon G 8784 1.919 30.1688 3.629 61.02 71.02 MM VAP 7.6 6005 4.179 30.1688 3.629 61.02 71.02 MM VAP 7.6 6005 4.179 30.1688 3.629 61.02 71.02 MM VAP 7.6 6005 4.179 50.1688 3.629 61.02 71.02 MM VAP 7.6 71.02 4.085 51.00 5.00 5.00 5.00 5.00 5.00 5.00 5.					0																47%
SOUTHERN SCCC 28 MSA Berningham G 8616 2.535 1.090 1.388 1.917 54.53 667 ENTERGY EES_5.MSA. NewOrleans. G 8784 9.735 9.294 2.952 5.281 59.42 1.1,541 4.9 6923 SOUTHERN SCCC 26 MSA Macon, G 8784 6.802 0 5.109 6.381 54.56 2.448 ENTERGY EES_5.MSA. NewOrleans. G 8784 9.735 9.294 2.952 5.281 59.42 1.1,541 4.9 7067 F.JM VAP, 7.6 600 4.179 303 1.668 3.635 6.102 703P.JM VAP, 7.6 MSA. KnewOrleans. G 8784 9.735 9.294 2.952 5.281 59.42 1.1,541 4.9 7067 F.JM VAP, 7.6 600 4.179 303 1.668 3.635 6.102 703P.JM VAP, 7.6 MSA. KnewOrleans. G 8784 9.70 2.883 1.729 2.537 66.82 5999 4.8 5256 VACAR CPLE 1 MSA. Durbam G 7851 10.224 6.563 1.043 2.644 57.38 474P.JM UTHOR TVA. 3.MSA. KnewOrleans. G 8784 4.55 1.207 5.994 1.1,440 4.856 Calculation of the company of the compan											SOCO_10_MSA_Albany-										
SOUTHERN SOCO 26 MSA Macon G 8784 6.802 0 5.109 6.381 54.56 2.448 ENTERGY EES 5.MSA NewOrleans, G 8784 9.735 9.294 2.952 5.281 59.42 1.541 4.9 7057 17047 17047 1704 4.95 1704 4.95 1704 1704 4.95 1704 1704 1704 1704 1704 1704 1704 1704	ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	867	1,221	53.84	377	SOUTHERN	Valdosta_L	7471	3,431	4,125	-662	-2,746	58.74	-290	4.9	1223	14%
SOUTHERN SOCO 26 MSA Macon G 8784 6.802 0 5.109 6.381 54.56 2.448 ENTERGY EES 5.MSA NewOrleans, G 8784 9.735 9.294 2.952 5.281 59.42 1.541 4.9 7057 17047 17047 1704 4.95 1704 4.95 1704 1704 4.95 1704 1704 1704 1704 1704 1704 1704 1704	COLITUEDA	0000 00 1101 0: : :	0040	0.505	4 000	4 000	4.047	54.50	057	ENTEROY	FEO F MOA Namodaaaa O	0704	0.705	0.004	0.050	E 004	E0.40			0000	700/
Fig.	SOUTHERN	SOCO_28_MSA_Birmingnam_G	8010	2,535	1,090	1,398	1,917	54.53	007	ENTERGY	EES_5_WSA_NewOrleans_G	8784	9,735	9,294	-2,952	-5,281	59.42	-1,541	4.9	6923	79%
FM   VAP 7 G   6905   4,179   303   1,668   3,629   61.02   703   PJM   VAP, 33 MSA, DC, L   8784   910   2,983   1,729   2,537   65,82   999   4,8   5226   VACAR   CPLE 1, MSA, Durham G   7851   10,224   8,563   1,043   2,644   57.38   470   MSA VATVATHOR TVA, 3, MSA, KNOXIVIL L   8784   3,584   5,102   1,129   5.594   1,149   62,16   324   4.8   6370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,715   7,188   5,180   4,78   7,119   62,16   3,24   4.8   6370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,715   7,18   6,116   3,244   4.8   6,370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,185   7,18   6,116   3,244   4.8   6,370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,185   7,18   6,184   2,275   6,581   4.8   6,370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,185   7,18   6,184   2,275   6,581   4.8   6,370   MSA, VRYPP   NYSO, 3, NYC   8,794   6,185   7,18   6,184   2,275   6,581   4.8   6,370   MSA, VRYPP   NYSO, 3, NYC   8,794   1,385   1,394   3,4628   5,22   MSA, ANGVORIAN, 4,874   1,484   2,275   5,941   1,496   2,144   4,7   6,947   4,147   4,144   4,7   6,947   4,147   4,144   4,1	SOUTHERN	SOCO 26 MSA Macon G	8784	6.802	0	5.109	6.381	54.56	2,449	ENTERGY	EES 5 MSA NewOrleans G	8784	9.735	9.294	-2.952	-5.281	59.42	-1.541	4.9	7057	80%
VACAR   CPLE 1 MSA Durham G   7851   10,224   8.563   10,043   2.644   67.38   470 PJM   VAP 15 MSA VB-NOTOR L   8784   435   1,297   5.944   -1,149   62.16   3.24   4.8   63.70   1,749			6905	4,179	303	1,668	3,629	61.02	703	PJM	VAP_33_MSA_DC_L	8784	910	2,983			65.82		4.8		60%
NYPP NYISO_3.NYC 8784 6.711 2.657 1.860 2.732 65.41 1.068 P.M PSEG_3.MSA. NewYork. L 8784 1.843 2.275 9.46 1.857 70.18 5.83 4.8 7.319 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.																					59%
Full   DLCO   T.MSA   Pittsburgh   G   8616   1,644   25   1,310   1,633   46.28   522   PJM   AP   2,GEN_Albright3   8784   603   1,748   -1,008   -1,587   51.03   -452   4.7   4714																					73%
SOUTHERN SCCO 31 MSA Atlanta G 8771 11,765 1,583 3,929 9,802 54.70 1,885 ENTERGY EES,5 MSA NewOrlsans G 8784 9,735 9,294 -2,952 5,281 59,42 -1,541 4.7 6987 MISO FE 6, MSA Pittsburgh G 8784 2,371 213 1,921 2,287 46.37 783 PJM AP_2 GEN Albrighti3_L 8784 603 1,748 -1,008 -1,587 51.03 -452 4.7 4711 TVAUTHOR TVA_4 MSA Clarkswille G 8616 2,544 150 2,096 2,473 47.01 849 TVAUTHOR TVA_7 MSA Memphis_L 8769 7,215 5,982 -1,527 4,177 51.66 -692 4.7 5271 MISO AMRN_12 MSA_Chicago_L 8784 2,290 0, 21,19 2,290 3775 703 PJM NI_3 MSA_Chicago_L 8784 2,995 10,556 5,386 9,115 42.00 4,6 4290 MISO AMRN_12 MSA_SILOuis_L 6698 5,595 6,066 757 1,937 39.14 198 MISO AMRN_2 County_Macon_L 8784 174 1,209 -717 -1,139 43.77 -276 4.6 3648 MISO FE 9 MSA_Weirton_G 8610 1,860 112 1,265 1,807 46.33 506 PJM NI_3 MSA_Chicago_L 8784 603 1,748 +1,008 -1,587 51.03 -452 4.6 4705 MISO FE 9 MSA_Weirton_G 8610 1,860 1192 1,290 3775 703 PJM NI_3 MSA_Chicago_L 8784 603 1,748 +1,008 -1,587 51.03 -452 4.6 4705 MISO PL_2 MSA_DENS_COUNTY_MACON_L 8784 1,740 1,008 -1,587 51.03 -452 4.6 4705 MISO PL_2 MSA_DENS_COUNTY_MSA_DENS_													.,0.0						0		83%
MISO   FE 6 MSA Pittsburgh   G   8784   2.371   213   1.921   2.287   46.37   783 PJM   AP 2 GEN_AlbrighS   1   8784   603   1.748   1.1,008   1.1587   51.03   452   4.7   4711	r JIVI	DLCO_r_MSA_PIRSburgh_G	0010	1,044	25	1,310	1,033	40.28	522	r ulvi	AF_Z_GEN_AIDIIGIIIG_L	0184	603	1,748	-1,008	-1,587	51.03	-432	4.7	4/14	54%
MISO   FE 6 MSA Pittsburgh   G   8784   2.371   213   1.921   2.287   46.37   783 PJM   AP 2 GEN_AlbrighS   1   8784   603   1.748   1.1,008   1.1587   51.03   452   4.7   4711	SOUTHERN	SOCO 31 MSA Atlanta G	8771	11,765	1,583	3,929	9,802	54.70	1,885	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,952	-5,281	59.42	-1,541	4.7	6987	80%
PJM   NI 7 MSA Rochelle G   8784   2.290   0   2.119   2.290   37.75   70.2 PJM   NI 13 MSA Chicago L   8784   2.396   10.556   -5.386   -9.115   42.40   -2.006   4.6   4290   4.6   4290   4.6   4290   4.6			8784	2,371	213	1,921	2,287	46.37			AP_2_GEN_Albright3_L	8784		1,748	-1,008	-1,587	51.03	-452	4.7		54%
MISO   AMRN_12_MSA_SILouis_L   6698   5,059   6,066   757   1,937   39.14   198 MISO   AMRN_2_County_Macon_L   8784   174   1,209   -717   -1,139   43.77   -276   4.6   3648   7JM   NI_7_MSA_Rochelle_G   8784   2,290   0 2,119   2,290   37.75   703 PJM   NI_3_MSA_Chicago_L   8784   266   1,205   -634   -1,254   42.36   -236   4.6   4321   4331   4321   43					150						TVA_7_MSA_Memphis_L										60%
P.M. NI. 7 MSA Rochelle_G 8784 2.290 0 2.119 2.290 37.75 70.3 P.M. NI. 3 MSA Chicago_L 8784 26 1.205 -6.34 -1.254 42.36 -2.38 4.6 4321 MISO FE 9 MSA Weirton G 8610 1.12 1.265 1.807 46.43 508 P.JM AP_2_GEN_Albright3_L 8784 603 1.748 -1.008 -1.587 51.03 -452 4.6 4705 51.00					0																49%
MISO   FE 9 MSA Weiton G   8610   1.866   112   1.265   1.807   46.43   508 P.JM   AP 2 GEN Albright3 L   8784   603   1.748   -1.008   -1.587   51.03   -452   4.6   4705					6,066																42% 49%
P.M. VAP 7 G. Sept. 1, 1048					112																49% 54%
MISO IPL_2_MSA_Jasper_G 8784 1,678 0 1,431 1,664 45.61 573 P.JM AEP_1_MSA_Lynchburg_G 8784 843 2,162 -1,538 -2,299 50.18 -678 4.6 3748 MISO WEC_1_MSA_Chicago_G 8784 1,678 0 1,431 1,664 45.61 573 P.JM AEP_2_STA_TN-WV_L 8784 1,284 2,977 -1,555 -2,640 50.08 -684 4.5 192													0						1.0		60%
MISO WEC_1_MSA_Chicago_G 8784 1,728 303 896 1,134 35.99 283 MISO WEC_3_MSA_Milwaukee_G 6881 1,429 2,423 -261 -1,101 40.53 -73 4.5 92 MISO IPL_2_MSA_Jasper_G 8784 1,678 0 1,431 1,664 45.61 573 P.JM AEP_2_STA_TN-WV_L 8784 1,284 2,977 -1,555 -2,640 50.08 -684 4.5 4239   SPP WERE_1_MSA_Manhattan_G 8753 2,988 409 1,357 2,215 39.31 467 SPP KACP_7_MSA_KansasCity_L 8784 0 1,291 -691 -1,351 43.73 -265 4.4 3283   VACAR DUK_9_MSA_Charlotte_G 8780 14,681 9,966 3,113 5,523 54.32 1,485 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 227   SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 104   MISO NIPS_8_MSA_Chicago_G 8764 2,982 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lalayette_L 8784 144 1,712 -851 1,422 44.47 -332 4.4 1315   MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199 P.JM NI_3_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5692   SOUTHERN SOCO_32_MSA_Pascagoula_G 7388 3,574 2,674 452 1,568 51.77 184 ENTERGY BES_5_MSA_NewOrleans_G 8784 2,935 -5,281 59.42 -1,541 4.3 6642   PJM VAP_7_G 6905 4,179 303 1,666 3,629 61.02 703 P.JM AP_7_MSA_Lalayetnown-martir 8784 20 1,159 6-5,379 4.2 515 515 5.37 6515 5.37 184 ENTERGY BES_5_MSA_NewOrleans_G 8784 9,735 9,294 -2,552 -5,281 5.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NewOrleans_G 8784 9,735 9,294 -2,552 -5,281 5.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLeans_G 8784 9,735 9,294 -2,552 -5,281 5.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLEANS_G 8784 9,735 9,294 -2,552 -5,281 5.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLEANS_G 8784 9,735 9,294 -2,552 -5,281 5.37 3.4 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLEANS_G 8784 9,735 9,294 -2,552 -5,281 5.37 3.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLEANS_G 8784 9,735 9,294 -2,552 -5,281 5.37 3.37 4.2 515 5.37 184 ENTERGY BES_5_MSA_NEWORLEANS_G 8784 9,735 9,294 -2,552 -5,281 5.37 3.3 4.2 515 5.37 3.3 4.2 515 5.37 3.3 4.2 515 5.37 3.3 5.4 2.57 5.37 3.3 5.4 2.57 5.37 3.3 5.4 2.57					0	1,431	1,664	45.61	573	PJM						-2,299	50.18				43%
SPP WERE_I_MSA_Manhattan_G 8753 2,988 409 1,357 2,215 39.31 467 SPP KACP_7_MSA_KansasCity_L 8784 0 1,291 -691 -1,351 43.73 -265 4.4 3283  VACAR DUK_9_MSA_Charlotte_G 8780 14,681 9,966 3,113 5,523 54.32 1,485 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 227  SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 104  MISO NIPS 8_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lalayette_L 8784 144 1,712 -851 -1,422 44.47 -332 4.4 1315  NEPOOL NEPOOL_3_ME 4348 3,494 2,522 361 1,215 67.94 107 NEPOOL_6 WCMA 8762 4,285 3,417 -1,506 3,925 72.25 -953 4.3 7127    MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199 PJM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5692    SOUTHERN SOCO_3_2_MSA_Pascagoula_G 7388 3,574 2,674 452 1,568 55.77 184 ENTERGY EES_5_MSA_NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,451 4.3 6642    PJM VAP_T_G 600 5 4,179 303 1,668 3,629 61.02 703 PJM AP_T_MSA_Lalayetnoun-Marity 8784 203 1,153 -661 -1,096 55.25 -379 4.2 51515					303																1%
VACAR DUK_9_MSA_Charlotte_G 8780 14,681 9,966 3,113 5,523 54.32 1,485_SOUTHERN SOCO_10_MSA_Albany- SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755_SOUTHERN Valotsta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 104 MISO NIPS_8_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lafayette_L 8784 144 1,712 -662 -2,746 58.74 -290 4.4 104 MISO NIPS_0_NS_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lafayette_L 8784 144 1,712 -651 -1,422 44.47 -332 4.4 1315 MEPOOL_NEPOOL_S_MSE_CASS_CASS_CASS_CASS_CASS_CASS_CASS_CA	MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	45.61	573	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	4.5	4239	48%
VACAR DUK_9_MSA_Charlotte_G 8780 14,681 9,966 3,113 5,523 54.32 1,485 SOUTHERN SOCO_10_MSA_Albany- SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 SOUTHERN Valoista_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 104 MISO NIPS_8_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lafayett_L 8784 144 1,712 -651 -1,422 44.47 -332 4.4 1315 NEPOOL_3_ME 4348 3,494 2,522 361 1,212 67.94 107 NEPOOL_6_WCMA 8762 4,285 3,417 -1,506 -3,982 72.25 -953 4.3 7127 MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199 PJM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5692 SOUTHERN SOCO_32_MSA_Pascagoula G 7388 3,574 2,674 452 1,568 55.17 184 ENTERGY EES_MSA_NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,095 65.2 379 4.2 5115	SPP	MEDE 1 MSA Manhattan C	8752	2 000	400	1 257	2 215	30 21	467	SPP	KACP 7 MSA KansasCity I	8701	0	1 201	-601	-1 351	43.72	-265	4.4	2202	37%
VACAR DUK_9_MSA_Charlotte_G 8780 14,681 9,966 3,113 5,523 54.32 1,485 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 227 SOUTHERN SOCO_15_MSA_Birmingham_G 8623 12,464 9,217 1,611 4,984 54.34 755 SOUTHERN Valdosta_L 7471 3,431 4,125 -662 -2,746 58.74 -290 4.4 104 MISO NIPS 8_MSA_Chicago_G 8764 2,892 1,694 943 1,665 40.11 331 MISO CIN_7_MSA_Lalayette_L 8784 144 1,712 -851 1,422 44.47 -332 4.4 1315 NEPOOL_3 ME 4348 3,494 2,522 361 1,215 6,794 107NEPOOL_5 WCMA 8762 4,285 3,417 -1,506 -3,982 72.25 -953 4.3 7127 MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199 PJM NL13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5692 SOUTHERN VALOSTAR SOCO_32_MSA_Pascagoula_G 7388 3,574 2,674 452 1,568 55.77 184 ENTERGY EES_5_MSA_NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,541 4.3 6642 PJM VAP_T_G 6905 4,179 303 1,668 3,629 61.02 703 PJM AP_T_MSA_Hagerstown-Marit 8784 203 1,153 -661 -1,009 65.2 379 4.2 515 5	51 F	WEINE_I_IWOM_IVIAIIIIAIIAII_G	0133	2,500	409	1,357	2,213	35.31	407	OI F		0104	U	1,291	-091	-1,551	45.73	-200	4.4	3263	31%
SOUTHERN SOCO_15_MSA_Birmingham_G	VACAR	DUK_9_MSA_Charlotte_G	8780	14,681	9,966	3,113	5,523	54.32	1,485	SOUTHERN		7471	3,431	4,125	-662	-2,746	58.74	-290	4.4	227	3%
MISO NIPS 8 MSA Chicago G 8764 2 892 1.684 943 1.665 40.11 331 MISO CIN 7 MSA Latayette L 8784 1.44 1.712 -85.1 -1.422 44.47 -33.2 4.4 1315 NEPOOL 3 ME 3 ME 43.48 3.494 2.522 361 1.212 67.94 107NEPOOL NEPOOL 6 WCMA 8762 4.285 3.417 -1.508 -3.982 72.25 -953 4.3 7127 MISO ALTE 2 MSA Madison G 8616 1.665 441 606 1.085 38.13 199 P.JM NL 13 MSA Chicago L 8784 2.396 10.556 -5.386 -3.115 42.40 -2.006 4.3 5692 SOUTHERN SOCO 32 MSA Pascagoula G 7388 3.574 2.674 452 1.568 55.17 184 ENTERCY EES 5 MSA NewOrleans G 8784 9.735 9.294 -2.952 -5.281 59.42 -1.541 4.3 6642 P.JM VAP_T G 690 50 4.79 303 1.668 3.696 61.02 70.3 P.JM AP_T MSA Hagerstown-Martit 8784 203 1.153 -661 -1.009 65.25 -379 4.2 1515											SOCO_10_MSA_Albany-										
NEPOOL NEPOOL 3_ME 4348 3,494 2,522 361 1,212 67.94 107 NEPOOL 6_WCMA 8762 4,285 3,417 -1,506 -3,982 72.25 -953 4.3 7127 MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199PJM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5692 SOUTHERN SOCO_32_MSA_Pascagoula_G 7388 3,574 2,674 452 1,568 5.517 184 ENTERGY EES_5_MSA_NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,541 4.3 6642 PJM VAP_T_G 6905 4,179 303 1,668 3,629 61.02 703 PJM AP_T_MSA_Hagerstown-Martit 8784 203 1,153 -661 -1,099 65.25 -379 4.2 5115																					1%
MISO ALTE_2_MSA_Madison_G 8616 1,665 441 606 1,085 38.13 199 P.JM NI_13_MSA_Chicago_L 8784 2,396 10,556 -5,386 -9,115 42.40 -2,006 4.3 5592 SOUTHERN SOCO_32_MSA_Pascagoula_G 7388 3,574 2,674 452 1,568 55.17 184 ENTERGY EES_MSA_NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,541 4.3 6642 P.JM VAP_T_G 6005 4,179 303 1,668 3,629 61.02 703 P.JM AP_T_MSA_Hagerstown-Martik 8784 203 1,153 -661 -1,099 65.25 -379 4.2 5115																					15%
SOUTHERN SCOC 32 MSA Pascagoula G 7388 3,574 2,674 452 1,568 55.17 184 ENTERGY EES_5_MSA NewOrleans_G 8784 9,735 9,294 -2,952 -5,281 59.42 -1,541 4.3 6642 PJM VAP_7_G 6905 4,179 303 1,668 3,629 61.02 703 PJM AP_7_MSA_Hagerstown-Martil 8784 203 1,153 -661 -1,009 65.25 -379 4.2 5115																					81% 65%
PJM VAP_T_G 6905 4,179 303 1,668 3,629 61.02 703 PJM AP_T_MSA_Hagerstown-Martil 8784 203 1,153 -661 -1,009 65.25 -379 4.2 5115																					76%
																					58%
	MISO	ALTE_2_MSA_Madison_G	8616	1,665			1,085	38.13	199		NI_3_MSA_Chicago_L		26	1,205			42.36		4.2	5691	65%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub I	nformation								Sink Hub Info	rmation							10	Congestion I	ndicators	
Course Hub II	Hormation				Average				OIIIK I IUD II II	imatori				Average				Congestion	ndicators	
			_		net	Max net	Average	Revenue						net	Max net	Average	Revenue			
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
Warket Alea	Hub Name	Tiouis	weigni	weignt	(10100)	(IVIVV)	(φ/Ινίννιι)	(DIVIIVI)	IVIAINEL AIGA	SOCO_10_MSA_Albany-	110015	weight	vveigni	(10100)	(10100)	(φ/1010011)	(DIVIIVI)	Dillerential	090 110015	030 /8
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,398	1,917	54.53	657	SOUTHERN	Valdosta_L	7471	3,431	4,125	-662	-2,746	58.74	-290	4.2	109	1%
										SOCO_10_MSA_Albany-										
MISO	SOCO_26_MSA_Macon_G	8784 8712	6,802	0	5,109	6,381	54.56 48.10		SOUTHERN MISO	Valdosta_L FE_5_MSA_Cleveland_L	7471 6258	3,431	4,125 4.680	-662 -514	-2,746 -2,089	58.74	-290 -168	4.2 4.1	301	3%
	ITC_7_MSA_Monroe_G NEPOOL 3 ME	4348	1,500 3,494	2,522	1,307 361	1,500 1,212	67.94			NEPOOL 4 NEBOS	8656	3,216 3,262	5,904	-1,161	-3,970	52.20 72.00	-724	4.1	5477 7025	62% 80%
112. 002	NET GOE_G_ME	1010	0,101	L,OLL		.,2.2	07.01	107		SOCO_10_MSA_Albany-	0000	0,202	0,001	1,101	0,070	72.00			7020	0070
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	1,885		Valdosta_L	7471	3,431	4,125	-662	-2,746	58.74	-290	4.0	107	1%
MISO	ITC_3_MSA_Detroit_G	8784	3,815	1,600	1,266	1,970	48.24	536	MISO	FE_5_MSA_Cleveland_L	6258	3,216	4,680	-514	-2,089	52.20	-168	4.0	8350	95%
NYPP MISO	NYISO_8_NYH	8784	2,021	973	1,581	1,945	77.04	1,070	NYPP PJM	NYISO_10_NYJ	8784	10,283	11,493	-3,846	-5,293	80.87	-2,732	3.8	8784	100%
NYPP	FE_6_MSA_Pittsburgh_G NYISO 6 NYF	8784 7530	2,371 4,103	213 1,983	1,921 569	2,287 1,525	46.37 70.62	783 302		AEP_1_MSA_Lynchburg_G NYISO 7 NYG	8784 8388	843 3,156	2,162 2,195	-1,538 -698	-2,299 -1,444	50.18 74.41	-678 -436	3.8 3.8	6216 5105	71% 58%
	SOCO 17 MSA Mobile G	2046	5,205	4,575	214	1,180	58.33	26	FRCC	FPC 3 MSA Orlando L	8784	1,232	3,649	-1.857	-3.553	62.09	-1.013	3.8	4360	50%
MISO	FE_9_MSA_Weirton_G	8610	1,860	112	1,265	1,807	46.43	506	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	3.7	6046	69%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	3.7	5389	61%
NYPP	NYISO_1_NYA	8272	4,946	2,500	1,598	2,466	50.73		NYPP	NYISO_6_NYF	1254	4,103	1,983	-261	-1,145	54.41	-18	3.7	6498	74%
PJM MISO	AEP_8_GEN_Amos01_G FE 9 MSA Weirton G	8782 8610	19,694 1,860	6,544 112	5,935 1,265	10,177 1,807	48.54 46.43	2,530	PJM	FE_5_MSA_Cleveland_L AEP 2 STA TN-WV L	6258 8784	3,216 1,284	4,680 2,977	-514 -1.555	-2,089 -2,640	52.20 50.08	-168 -684	3.7 3.6	4008 5146	46% 59%
NYPP	NYISO 6 NYF	7530	4,103	1,983	569	1,525	70.62			NEPOOL 9 NWKST	8784	405	1,524	-1,555	-1,248	74.26	-454	3.6	8768	100%
	N1100_0_N11	7000	1,100	1,000		1,020	70.02	002		EES_7_MSA_Beaumont-	0.01	.00	1,021	000	1,210	,20	.0.	0.0	0,00	10070
SPP	AEPW_9_MSA_MountPleasant_	7978	8,168	3,832	800	1,815	50.17	320	ENTERGY	PortArthur_G	7005	7,393	4,949	-489	-1,659	53.78	-184	3.6	8732	99%
										SOCO_10_MSA_Albany-										
SOUTHERN MISO	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17	184	SOUTHERN	Valdosta_L	7471	3,431	4,125	-662	-2,746	58.74	-290	3.6	1195	14%
FRCC	EKPC_8_MSA_Maysville_G SEC 6 MSA Palatka G	8784 8160	1,396 1,330	272	936	1,366 1,330	48.33 61.35	397	FRCC	TVA_3_MSA_Knoxville_L FPL_2_MSA_FortMyers_G	8784 8513	3,684 5,929	5,102 4,563	-1,206 -1,058	-2,885 -2,545	51.80 64.81	-549 -584	3.5 3.5	5029 4349	57% 50%
SPP	AEPW 9 MSA MountPleasant	7978	8,168	3,832	800	1,815	50.17			EES 9 MSA Russellville G	6263	6,123	4,503	-444	-1,617	53.58	-149	3.4	8738	99%
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,949	2,769	50.33	861	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	9,154	8,858	-1,542	-4,313	53.67	-706	3.3	5690	65%
NEPOOL	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637		NEPOOL_6_WCMA	8762	4,285	3,417	-1,506	-3,982	72.25	-953	3.3	7124	81%
MISO	AMRN_12_MSA_StLouis_L	6698	5,059	6,066	757	1,937	39.14		PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,386	-9,115	42.40	-2,006	3.3	5484	62%
PJM ENTERGY	AEP_8_GEN_Amos01_G	8782 8784	19,694 3,525	6,544	5,935 1,949	10,177	48.54 50.33	2,530 861		TVA_3_MSA_Knoxville_L EES 9 MSA Russellville G	8784 6263	3,684	5,102	-1,206 -444	-2,885 -1,617	51.80 53.58	-549 -149	3.3 3.2	5789	66%
MISO	EES_2_MSA_Batesville_G AMRN_12_MSA_StLouis_L	6698	5,059	1,697 6,066	757	2,769 1,937	39.14			NI 3 MSA Chicago L	8784	6,123 26	4,517 1,205	-444	-1,617	42.36	-149	3.2	2262 5318	26% 61%
WIIGO	AWIKIN_12_WISA_Steodis_E	0000	3,000	0,000	707	1,507	00.14	130	1 0101	NI_0_WIGH_OHICAGO_E	0/04	20	1,200	004	1,204	42.00	200	0.2	3310	0176
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,860	2,732	65.41	1,069		PSEG_5_MSA_Philadelphia_L	8784	2,143	2,766	-959	-1,990	68.62	-578	3.2	7610	87%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,427	6,440	62.90	1,893		AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	66.07	-463	3.2	3656	42%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	47.01	849	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	3.2	5806	66%
FRCC NEPOOL	FPL_8_MSA_PortStLucie_G NEPOOL 7 CT	8747 7678	10,364 4,447	4,623 3,920	1,944 726	5,374 1,796	64.08 71.28	1,089 397	FRCC NYPP	FPL_7_MSA_Miami_L NYISO 7 NYG	8784 8388	570 3,156	3,923 2,195	-2,488 -698	-4,070 -1,444	67.21 74.41	-1,469 -436	3.1 3.1	3401 6168	39% 70%
PJM	AEP 8 GEN Amos01 G	8782	19,694	6,544	5,935	10,177	48.54	2,530	TVAUTHOR	TVA 7 MSA Memphis L	8769	7.215	5,982	-1,527	-4,177	51.66	-692	3.1	5373	61%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,096	2,473	47.01	849	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	3.1	5246	60%
FRCC	FPL_8_MSA_PortStLucie_G	8747	10,364	4,623	1,944	5,374	64.08	1,089		FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	3.1	2924	33%
	NEPOOL_2_NH	8519	4,204	2,621	1,085	1,925	68.93	637	NEPOOL	NEPOOL_4_NEBOS	8656	3,262	5,904	-1,161	-3,970	72.00	-724	3.1	7017	80%
NEPOOL SPP	NEPOOL_7_CT AEPW 9 MSA MountPleasant	7678 7978	4,447 8,168	3,920 3,832	726 800	1,796 1,815	71.28 50.17	397	NEPOOL ENTERGY	NEPOOL_9_NWKST EES 1 MSA Jackson L	8784 8784	405 3,218	1,524 3,066	-696 -1,220	-1,248 -1,970	74.26 53.10	-454 -569	3.0 2.9	8753 8737	100% 99%
PJM	VAP_1_MSA_MountPleasant_	8784	10,524	3,579	3,427	6,440	62.90	1,893		VAP 33 MSA DC L	8784	910	2,983	-1,729	-2,537	65.82	-999	2.9	3845	99% 44%
PJM	NI 7 MSA Rochelle G	8784	2,290	0,070	2,119	2,290	37.75		MISO	WEC_3_MSA_Milwaukee_G	6881	1,429	2,423	-261	-1,101	40.53	-73	2.8	4508	51%
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	908	1,349	62.05		FRCC	FPL_2_MSA_FortMyers_G	8513	5,929	4,563	-1,058	-2,545	64.81	-584	2.8	4333	49%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,427	6,440	62.90	1,893		VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	65.61	-369	2.7	2913	33%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,427	6,440	62.90	1,893	PJM	VAP_7_G	1879	4,179	303	-1,021	-1,772	65.53	-126	2.6	5448	62%
FRCC MISO	FPC_2_MSA_HomosassaSpring FE 6 MSA Pittsburgh G	8784 8784	1,584 2,371	213	1,421 1,921	1,584 2,287	62.19 46.37		FRCC MISO	FPL_2_MSA_FortMyers_G ITC_2_MSA_Detroit_L	8513 8540	5,929 4,001	4,563 5,247	-1,058 -1,016	-2,545 -3,744	64.81 48.87	-584 -424	2.6 2.5	5026 7178	57% 82%
PJM	AEP 8 GEN Amos01 G	8782	19,694	6,544	5,935	10,177	48.54	2,530		AP 2 GEN Albright3 L	8784	603	1,748	-1,018	-1,587	51.03	-452	2.5	6176	70%
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	0	1,231	1,330	61.35	616	FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,476	-2,354	63.83	-827	2.5	4106	47%
MISO	FE_9_MSA_Weirton_G	8610	1,860	112		1,807	46.43	506	MISO	ITC_2_MSA_Detroit_L	8540	4,001	5,247	-1,016	-3,744	48.87	-424	2.4	7054	80%
	ALTE_2_MSA_Madison_G	8616	1,665	441		1,085	38.13 67.64		MISO	WEC_3_MSA_Milwaukee_G JCPL 1 MSA NewYork L	6881	1,429	2,423	-261	-1,101	40.53	-73 -530	2.4	1753	20%
	PL_8_MSA_Allentown_G NEPOOL 5 SEMA	6728 8784	2,853 6,454	385 3,978	390 1,703	2,261 3,589	67.64 72.03	177 1 078	PJM NYPP	JCPL_1_MSA_NewYork_L NYISO_7_NYG	8784 8388	3,156	1,792 2,195	-862 -698	-1,934 -1,444	70.02 74.41	-530 -436	2.4 2.4	7836 6199	89% 71%
TALL OOL	INCI OOL_J_SEIVIM	0704	0,434	3,370	1,703	3,309	12.03	1,070		AP_7_MSA_Hagerstown-	0300	3,130	2,150	-030	-,	, 4.41	-400	2.4	0199	1170
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,427	6,440	62.90	1,893		Martinsburg_L	8784	203	1,153	-661	-1,009	65.25	-379	2.4	4553	52%
FRCC	FPC_10_MSA_Lakeland_G	8028	3,561	747	1,085	2,055	64.87	565	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,488	-4,070	67.21	-1,469	2.3	4364	50%
MISO	NIPS_8_MSA_Chicago_G	8764	2,892	1,694	943	1,665	40.11	331	PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,386	-9,115	42.40	-2,006	2.3	161	2%
FRCC	FPC_10_MSA_Lakeland_G	8028	3,561	747	1,085	2,055	64.87	565	FRCC	FPL_3_MSA_Miami_L	8784	6,944	7,089	-1,934	-4,084	67.15	-1,141	2.3	4364	50%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	12,464	9,217	1,611	4,984	54.34	755	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,203	-2,678	56.60	-598	2.3	2692	31%
23011127(14	CCCC_TO_MOR_DITTINGHAIT_G	3020	.2,.04	0,217	.,511	.,004	0 1.04	. 00		AEP_9_MSA_Canton-	3.04	.,507	0,200	.,200	2,0.0	55.50	550	2.0	2032	5176
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,431	1,664	45.61		PJM	Massillon_L	8784	733	2,120	-1,491	-2,063	47.87	-627	2.3	2329	27%
MISO	NIPS_8_MSA_Chicago_G	8764	2,892	1,694	943	1,665	40.11		PJM	NI_3_MSA_Chicago_L	8784	26	1,205	-634	-1,254	42.36	-236	2.2	2	0%
PJM	PJM500_4_MSA_Philadelphia_0	8397	2,383	0	1,320	2,295	68.14	755	PJM	PSEG_8_MSA_NewYork_G SOCO 10 MSA Albany-	8784	3,860	3,654	-1,121	-2,452	70.38	-693	2.2	7557	86%
VACAR	SCEG 1 MSA Columbia G	7951	4.954	2.752	918	2.554	56.51	<b>∆</b> 13	SOUTHERN	Valdosta L	7471	3.431	4.125	-662	-2.746	58.74	-290	2.2	308	4%
	NEPOOL 5 SEMA	8784	6,454	3,978	1,703	3,589	72.03			NEPOOL 9 NWKST	8784	405	1,524	-696	-1,248	74.26	-454	2.2	8753	100%
			-,	-,0	.,	-,-50	50	.,,,,,,				0	.,		,	0	'			.0070

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub Ir	nformation								Sink Hub Info	rmation								Congestion	Indicators	
					Average									Average				geemen		
		0	0	1	net	Max net	Average	Revenue			0:-1-	0	1	net	Max net	Average	Revenue	D-:		1
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
Warket Area	Tido Name	110013	vvoigin	vvoigni	(10104)	(10100)	(φ/14/44/1)	(ФІЧПЧІ)	Warket Area	EES_7_MSA_Beaumont-	riouis	vvcigitt	vvoigni	(10100)	(10100)	(ψ/101011)	(ψινιινι)	Dilicicitiai	OSO FIOUIS	030 70
SPP	AEPW_5_MSA_Tulsa_G	7478	4,226	2,571	420	1,245	51.57	162	ENTERGY	PortArthur_G	7005	7,393	4,949	-489	-1,659	53.78	-184	2.2	6128	70%
T. (4.1.T. 10.D.		0700	47.004		0.045	0.400		4 400	00117115011	0000 40 1404 44 4	0704	004	0.050	4 007	0.040		000			
IVAUIHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1,482	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,297	-2,646	54.66	-623	2.2	165	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1.482	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	54.66	-878	2.2	176	2%
	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1,482		SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	54.65	-511	2.2	211	2%
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	77.04	1,070	NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	79.19	-527	2.2	6666	76%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1.482	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,808	-2,983	54.64	-868	2.1	72	1%
			,	.,						SOCO_6_MSA_Augusta-		,	- ,	,	,					
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1,482	SOUTHERN	Richmond_L	8784	0	1,187	-657	-1,116	54.61	-315	2.1	6	0%
TVAUTHOR	TVA 1 MSA Chatt-Hunts G	8782	17,334	9,966	3,215	6,406	52.50	1,482	SOUTHERN	SOCO_21_MSA_Atlanta_G	8768	3,334	2,733	-858	-1,940	54.60	-411	2.1		0%
TVAOTTIOK	TVA_T_MSA_CHatt-Hullis_G	0702	17,334	3,300	3,213	0,400	32.30	1,402	SOUTHLIN	3000_Z1_W3A_Alianta_G	6700	3,334	2,733	-000	-1,540	34.00	-411	2.1	0	0%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,398	1,917	54.53	657		SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,203	-2,678	56.60	-598	2.1	2736	31%
PJM	PJM500_4_MSA_Philadelphia_0	8397	2,383	0	1,320	2,295	68.14	755	PJM	PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-946	-1,857	70.18	-583	2.0	7430	85%
COLITHERN	0000 00 1404 14 0	8784	6.802	0	5.109	6.381	54.56	2,449	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.607	3.236	-1,203	-2,678	56.60	-598	2.0	4000	400/
SPP	SOCO_26_MSA_Macon_G AEPW 5 MSA Tulsa G	7478	4,226	2,571	5,109	1,245	51.57		ENTERGY	EES 9 MSA Russellville G	6263	6,123	4,517	-1,203	-1,617	53.58	-598	2.0	1069 5850	12% 67%
PJM	DPL_8_GEN_Killen_G	8784	2,964	0	2,193	2,940	48.23	929	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,538	-2,299	50.18	-678	1.9	3074	35%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1,482	MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,651	-2,733	54.41	-789	1.9	1078	12%
COLITHERN	0000 04 1404 141-4- 0	8771	11 705	1,583	3,929	9.802	54.70	1,885	VACAR	SCPSA 2 MSA Charleston L	8784	1 607	3,236	-1,203	-2,678	56.60	-598	1.0	0740	040/
FRCC	SOCO_31_MSA_Atlanta_G FPC 2 MSA HomosassaSpring	8771	11,765 1,584	1,383 N	1,421	1,584	62.19		FRCC	TECO 7 MSA Tampa L	8784 8784	1,607	1,481	-1,203 -951	-2,078	64.08	-535	1.9	2713 3806	31% 43%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37	783		ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,073	-4,218	48.23	-878	1.9	7748	88%
PJM	DPL_8_GEN_Killen_G	8784	2,964	0	2,193	2,940	48.23		PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	1.9	1911	22%
	FE_9_MSA_Weirton_G	8610	1,860	112	1,265	1,807	46.43		MISO	ITC_9_MSA_Detroit_L	8784	1,340	4,751	-2,073	-4,218	48.23	-878	1.8	7668	87%
MISO MISO	EKPC_8_MSA_Maysville_G LGEE 3 GEN Gehnt2 G	8784 8784	1,396 2,000	272 225	936 1,487	1,366 1,898	48.33 44.78		PJM MISO	AEP_2_STA_TN-WV_L CIN 1 MSA Indianapolis L	8784 8784	1,284 816	2,977 4,274	-1,555 -2,181	-2,640 -3,310	50.08 46.47	-684 -890	1.8 1.7	1479 4114	17% 47%
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,495	4,144	42.11		MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	43.77	-276	1.7	4060	46%
PJM	PJM500_8_MSA_Philadelphia_0	8784	3,914	0	3,138	3,868	68.73	1,894		PSEG_8_MSA_NewYork_G	8784	3,860	3,654	-1,121	-2,452	70.38	-693	1.6	7550	86%
	FPC_2_MSA_HomosassaSpring	8784	1,584	0	1,421	1,584	62.19		FRCC	FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,476	-2,354	63.83	-827	1.6	2819	32%
PJM NYPP	AEP_8_GEN_Amos01_G NYISO 6 NYF	8782 7530	19,694 4,103	6,544 1,983	5,935 569	10,177 1,525	48.54 70.62			AEP_1_MSA_Lynchburg_G NEPOOL_6_WCMA	8784 8762	843 4,285	2,162 3,417	-1,538 -1,506	-2,299 -3,982	50.18 72.25	-678 -953	1.6 1.6	3196 7463	36% 85%
ONTARIO	IESO_6_G	8784	2,146	1,363	1,844	2,071	47.25		MISO	ITC_2_MSA_Detroit_L	8540	4,001	5,247	-1,016	-3,744	48.87	-424	1.6	8717	99%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	47.25		MISO	ITC_2_MSA_Detroit_L	8540	4,001	5,247	-1,016	-3,744	48.87	-424	1.6	8725	99%
ONTARIO	IESO_15_G	8385	1,964	3,375	1,097	2,054	47.28	435	MISO	ITC_2_MSA_Detroit_L	8540	4,001	5,247	-1,016	-3,744	48.87	-424	1.6	8703	99%
PJM	DI CO 7 MCA Ditt-burne C	8616	1.644	25	1,310	1,633	46.28	500	PJM	AEP_9_MSA_Canton- Massillon L	8784	733	2.120	-1,491	-2,063	47.87	-627	1.6	4507	51%
MISO	DLCO_7_MSA_Pittsburgh_G CIN 3 MSA TerreHaute G	7044	3,230	1,015	716	2,206	48.62		PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,120	-1,538	-2,003	50.18	-678	1.6	4507 3183	36%
PJM	NI 6 MSA Chicago G	8068	9,759	7,577	994	2,629	42.22	339	MISO	AMRN_2_County_Macon_L	8784	174	1,209	-717	-1,139	43.77	-276	1.5	4018	46%
PJM	AEP_8_GEN_Amos01_G	8782	19,694	6,544	5,935	10,177	48.54	2,530		AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	1.5	2	0%
SPP	AEPW_5_MSA_Tulsa_G	7478	4,226	2,571	420	1,245	51.57	162	ENTERGY	EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,220	-1,970	53.10	-569	1.5	5552	63%
VACAR	SCPSA 10 MSA Charleston G	8616	1,680	0	1,473	1,680	55.09	600	VACAR	SCPSA 2 MSA Charleston L	8784	1,607	3,236	-1,203	-2,678	56.60	-598	1.5	2261	26%
MAPP	MEC 3 MSA DesMoines G	7974	3,307	1,933	904	1,380	31.70		MAPP	OPPD_5_MSA_Omaha_L	8784	480	1,686	-847	-1,503	33.20	-247	1.5	2205	25%
										AEP_9_MSA_Canton-										
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37		PJM	Massillon_L	8784	733	2,120	-1,491	-2,063	47.87	-627	1.5	4457	51%
PJM ONTARIO	DLCO_7_MSA_Pittsburgh_G IESO_6_G	8616 8784	1,644 2,146	25 147	1,310 1,844	1,633 2,071	46.28 47.25		MISO NYPP	FE_4_MSA_Akron_L NYISO 2 NYB	8784 8784	531 650	2,277 1,759	-1,209 -706	-1,732 -1,572	47.77 48.73	-507 -302	1.5 1.5	1894 8457	22% 96%
ONTARIO	IESO 7 G	8784	2,140	253	2,502	2,825	47.25		NYPP	NYISO 2 NYB	8784	650	1,759	-706	-1,572	48.73	-302	1.5	8505	97%
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,949	2,769	50.33	861		TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,206	-2,885	51.80	-549	1.5	3620	41%
MISO	CIN_3_MSA_TerreHaute_G	7044	3,230	1,015	716	2,206	48.62	245		AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,555	-2,640	50.08	-684	1.5	3863	44%
ONTARIO PJM	IESO_15_G	8385 8784	1,964 3,914	3,375	1,097 3,138	2,054 3,868	47.28 68.73	435 1,894		NYISO_2_NYB	8784 8784	650 1,843	1,759	-706 -946	-1,572 -1,857	48.73 70.18	-302 -583	1.5 1.5	8441 7423	96%
PJM	PJM500_8_MSA_Philadelphia_0 NI_15_MSA_Davenport_G	8664	2,479	0	1,716	2,314	35.62		MISO	PSEG_3_MSA_NewYork_L WEC_7_MSA_Milwaukee_G	8097	3,850	2,275 3,052	-563	-1,631	37.06	-583	1.5	7423 4640	85% 53%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	12,464	9,217	1,611	4,984	54.34	755	VACAR	SCEG_9_MSA_Charleston_G	8439	1,152	1,944	-355	-1,540	55.77	-167	1.4	2805	32%
MISO	EE O MOA Wointer O	8610	4 060	440	1,265	1,807	46.43	E00	PJM	AEP_9_MSA_Canton- Massillon L	8784	700	2 4 2 2	-1,491	2.062	47.87	-627	4.4	2000	4501
IVIIOU	FE_9_MSA_Weirton_G	8010	1,860	112	1,265	1,807	46.43	506	r JIVI	IVIA33IIIUII_L	8/84	733	2,120	-1,491	-2,063	47.87	-027	1.4	3963	45%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	3,574	2,674	452	1,568	55.17	184	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,203	-2,678	56.60	-598	1.4	4298	49%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,921	2,287	46.37	783	MISO	FE_4_MSA_Akron_L	8784	531	2,277	-1,209	-1,732	47.77	-507	1.4	1849	21%
NYPP	NYISO_6_NYF	7530	4,103	1,983	569	1,525	70.62	302		NEPOOL_4_NEBOS	8656	3,262	5,904	-1,161	-3,970	72.00	-724	1.4	7489	85%
PJM ENTERGY	PJM500_4_MSA_Philadelphia_0	8397 8784	2,383 3,525	1 607	1,320 1,949	2,295 2,769	68.14 50.33	755 861	PJM TVAUTHOR	JCPL_3_MSA_NewYork_L TVA_7_MSA_Memphis_L	8784 8769	1,315 7,215	2,735 5,982	-651 -1,527	-1,985 -4,177	69.48 51.66	-397 -692	1.3 1.3	6116 3146	70%
MISO	EES_2_MSA_Batesville_G FE_9_MSA_Weirton_G	8610	1,860	1,697 112	1,949	1,807	46.43	506		FE 4 MSA Akron L	8784	531	2,277	-1,527	-1,732	47.77	-592	1.3	3146	36% 42%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	46.28	522		FE_7_MSA_Toledo_L	8779	2,586	2,106	-673	-1,149	47.61	-281	1.3	6268	71%
			4						00117:::											
I VAU [HOR	TVA_1_MSA_Chatt-Hunts_G	8782	17,334	9,966	3,215	6,406	52.50	1,482	SOUTHERN	SOCO_17_MSA_Mobile_G	6738	5,205	4,575	-421	-1,892	53.83	-153	1.3	2772	32%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2008R2

Source Hub Ir	oformation								Sink Hub Info	rmation								Congestion	Indicators	
Source Hub II	iloination				Average				Silik Hub illic	imation				Average				Congestion	Indicators	
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
ENTERGY	EES 4 GEN Ouachita G	5475	6,345	2,417	1,195	3,528	58.13	380	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,952	-5,281	59.42	-1,541	1.3	6334	72%
	FE 6 MSA Pittsburgh G	8784	2,371	213	1,921	2,287	46.37		MISO	FE_7_MSA_Toledo_L	8779	2,586	2,106	-673	-1,149	47.61	-281	1.2	6211	71%
	_																			
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,398	1,917	54.53	657	VACAR	SCEG_9_MSA_Charleston_G	8439	1,152	1,944	-355	-1,540	55.77	-167	1.2	2820	32%
SOLITHERN	SOCO 26 MSA Macon G	8784	6,802	0	5,109	6,381	54.56	2 440	VACAR	SCEG 9 MSA Charleston G	8439	1,152	1,944	-355	-1,540	55.77	-167	1.2	2778	32%
	FE 9 MSA Weirton G	8610	1,860	112	1,265	1,807	46.43			FE 7 MSA Toledo L	8779	2,586	2,106	-673	-1,149	47.61	-281	1.2	5824	66%
	TVA 1 MSA Chatt-Hunts G	8782	17,334	9,966	3,215	6,406	52.50			TVA_5_MSA_Nashville_L	8531	9,154	8,858	-1,542	-4,313	53.67	-706	1.2	124	1%
	VAP_7_G	6905	4,179	303	1,668	3,629	61.02		PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-594	-1,149	62.16	-324	1.1	5313	60%
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	47.25	765	ONTARIO	IESO_2_G	8715	2,437	2,116	-1,113	-1,779	48.38	-469	1.1	4622	53%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	47.25		ONTARIO	IESO_2_G	8715	2,437	2,116	-1,113	-1,779	48.38	-469	1.1	5244	60%
ONTARIO	IESO_15_G	8385	1,964	3,375	1,097	2,054	47.28	435	ONTARIO	IESO_2_G	8715	2,437	2,116	-1,113	-1,779	48.38	-469	1.1	8089	92%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046	5,205	4,575	214	1,180	58.33	26	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,952	-5,281	59.42	-1,541	1.1	6819	78%
	TVA 1 MSA Chatt-Hunts G	8782	17,334	9,966	3,215	6,406	52.50			EES 9 MSA Russellville G	6263	6,123	4,517	-444	-1,617	53.58	-149	1.1	1202	14%
	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,134	35.99	283	MISO	WEC_7_MSA_Milwaukee_G	8097	3,850	3,052	-563	-1,631	37.06	-169	1.1	9	0%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	11,765	1,583	3,929	9,802	54.70	1,885	VACAR	SCEG_9_MSA_Charleston_G	8439	1,152	1,944	-355	-1,540	55.77	-167	1.1	2819	32%
ļ																				
							<b> </b>				<b> </b>									
	-																			
ļ																				
							<b> </b>				<b> </b>									
<del>                                     </del>							<b> </b>				<b> </b>									+
							1				1									
							l				l									

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub Ir	formation								Sink Hub Info	rmation								Congestion	Indicators	
					Average	M	A							Average	M					
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
MAPP ONTARIO	MEC_3_MSA_DesMoines_G IESO 6 G	8009 8784	3,307 2,146	1,933	939	1,547 2,071	24.54 37.71			AMRN_12_MSA_StLouis_L NYISO 11 NYK	2082 8784	5,059 5,681	6,066 5,289	-463 -1.869	-1,852 -2,703	45.08 56.62	-44 -930	20.5	4097 6364	47% 72%
ONTARIO	IESO_6_G IESO_7_G	8784 8784	2,146	253	2,502	2,825	37.71			NYISO_11_NYK NYISO_11_NYK	8784 8784	5,681	5,289	-1,869	-2,703	56.62	-930	18.9	6364	72%
ONTARIO	IESO_15_G	8396	1,964	3,375	1,094	2,054	37.72	347	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62	-930	18.9	6364	72%
	NYISO_1_NYA	8323	4,946	2,500	1,595		40.13			NEPOOL_7_CT	1117	4,447	3,920	-320	-1,094	58.57	-21	18.4	6361	72%
PJM ONTARIO	NI_15_MSA_Davenport_G IESO 6_G	8670 8784	2,479 2,146	0 147	1,728 1,844	2,314 2,071	27.04 37.71			AMRN_12_MSA_StLouis_L NYISO_10_NYJ	2082 8784	5,059 10,283	6,066 11,493	-463 -3,758	-1,852 -5,317	45.08 55.54	-44 -1,833	18.0 17.8	5766 8784	66% 100%
ONTARIO	IESO_7_G	8784	2,140	253	2,502	2,825	37.71			NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	17.8	8784	100%
	IESO_15_G	8396	1,964	3,375	1,094	2,054	37.72	347	NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	17.8	8784	100%
	NI_7_MSA_Rochelle_G IESO 6 G	8784 8784	2,290 2,146	0 147	2,119 1.844		28.20 37.71			AMRN_12_MSA_StLouis_L NYISO 9 NYI	2082 8467	5,059	6,066	-463 -786	-1,852 -1,993	45.08 54.32	-44 -362	16.9 16.6	6315 6353	72% 72%
ONTARIO	IESO_6_G	8784 8784	2,146	253	2,502	2,825	37.71			NYISO_9_NYI	8467	2	1,476 1,476	-786		54.32	-362	16.6	6353	72%
ONTARIO	IESO_15_G	8396	1,964	3,375	1,094	2,054	37.72	347	NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	54.32	-362	16.6	6353	72%
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13			NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62	-930	16.5	6364	72%
	AEP_8_GEN_Amos01_G OTP_9_GEN_BigStone_G	8784 8784	19,694 1,189	6,544 136	6,359 737	10,066 1,096	38.79 18.91	2,167	MISO	VAP_7_G XEL_3_MSA_Minneapolis_G	1371 4678	4,179 7,596	303 7,622	-974 -853	-1,741 -2,814	55.16 34.89	-74 -139	16.4 16.0	6666 8076	76% 92%
	NYISO 1 NYA	8323	4,946	2,500	1,595	2,319	40.13			NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	15.4	8784	100%
										OKGE_4_MSA_OklahomaCity				·						
SPP NYPP	WERE_1_MSA_Manhattan_G NYISO 1 NYA	8739	2,988	409	1,343		31.03		SPP	L NVICO O NVI	8773	2,102	2,403	-781	-1,550	46.32	-317	15.3	8490	97%
	NYISO_1_NYA IESO 6 G	8323 8784	4,946 2,146	2,500 147	1,595 1,844	2,319 2,071	40.13 37.71			NYISO_9_NYI NYISO 7 NYG	8467 8420	3,156	1,476 2,195	-786 -732	-1,993 -1,477	54.32 51.85	-362 -320	14.2 14.1	6289 6351	72% 72%
ONTARIO	IESO_7_G	8784	2,953	253	2,502	2,825	37.71	829	NYPP	NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	14.1	6351	72%
ONTARIO	IESO_15_G	8396	1,964	3,375	1,094		37.72			NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	14.1	6350	72%
	NI_15_MSA_Davenport_G NI_15_MSA_Davenport_G	8670 8670	2,479 2,479	0	1,728 1,728	2,314 2,314	27.04 27.04		PJM PJM	AEP_1_MSA_Lynchburg_G AEP_2_STA_TN-WV_L	8784 8784	843 1,284	2,162 2,977	-1,529 -1,591	-2,299 -2,640	39.95 39.59	-537 -553	12.9 12.5	7290 6500	83% 74%
	•																			
SPP	WERE_1_MSA_Manhattan_G	8739	2,988	409	1,343	2,277	31.03			WERE_4_GEN_Wolfcreek_G	3632	3,510	2,459	-481	-1,564	43.55	-76	12.5	3238	37%
MAPP NEPOOL	NPPD_4_GEN_Gentleman_G NEPOOL 3 ME	8760 3752	2,702 3,494	148 2,522	626 297	1,477 1,074	12.49 46.10			OPPD_5_MSA_Omaha_L NEPOOL_7_CT	8784 1117	480 4.447	1,686 3,920	-848 -320	-1,521 -1.094	24.99 58.57	-186	12.5 12.5	8388 7545	95% 86%
PJM	NI 2 MSA Chicago G	8784	5,342	1,283	3,498	4,181	32.75			AMRN 12 MSA StLouis L	2082	5,059	6,066	-463	-1,852	45.08	-21 -44	12.3	3925	45%
PJM	PENELEC_2_MSA_DuBois_G	7753	2,724	1,196	568		44.34			NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62	-930	12.3	6364	72%
PJM	NI_6_MSA_Chicago_G	8321	9,759	7,577	1,110	3,034	33.17	306		AMRN_12_MSA_StLouis_L AEP 9 MSA Canton-	2082	5,059	6,066	-463	-1,852	45.08	-44	11.9	3935	45%
P.JM	NI_15_MSA_Davenport_G	8670	2,479	0	1,728	2,314	27.04	405		Massillon_L	8784	733	2,120	-1,414	-2,058	38.80	-482	11.8	6037	69%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81			NEPOOL_7_CT	1117	4,447	3,920	-320	-1,094	58.57	-21	11.8	8766	100%
PJM	NI 7 MSA Rochelle G	8784	2,290	0	2,119	2,290	28.20	525	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	11.7	7000	80%
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13	533	NYPP	NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	11.7	6192	70%
	NI_20_MSA_Chicago_G	7234 8784	1,632	83	896		33.43			AMRN_12_MSA_StLouis_L	2082 1371	5,059 4,179	6,066	-463 -974	-1,852	45.08 55.16	-44 -74	11.7	3912	45% 60%
	AP_1_County_Harrison_G DLCO_7_MSA_Pittsburgh_G	8616	6,563 1.644	2,223 25	2,424 1,310		43.51 38.01			VAP_7_G AP 8 MSA DC-VA-MD L	8784	4,179	303 1.097	-798	-1,741 -1.144	49.61	-74	11.6 11.6	5280 8009	91%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923	2,287	38.10	643	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	49.61	-348	11.5	8003	91%
MISO	FE_9_MSA_Weirton_G	8628	1,860	112	1,220	1,808	38.10			AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	49.61	-348	11.5	7970	91%
PJM PJM	PJM500_3_MSA_Pittsburgh_G NI_7_MSA_Rochelle_G	8758 8784	1,705 2,290	0	1,368 2,119		43.76 28.20			VAP_7_G AEP_2_STA_TN-WV_L	1371 8784	4,179 1,284	303 2,977	-974 -1,591	-1,741 -2,640	55.16 39.59	-74 -553	11.4 11.4	6524 6397	74% 73%
	NYISO 1 NYA	8323	4,946	2,500	1,595		40.13			NEPOOL_9_NWKST	8784	405	1,524	-692	-1,141	51.52	-313	11.4	6370	73%
MISO	IP_8_GEN_Clinton_G	8011	2,302	1,195	917	1,230	33.74		MISO	AMRN_12_MSA_StLouis_L	2082	5,059	6,066	-463	-1,852	45.08	-44	11.3	1664	19%
ENTERGY	EES 9 MSA Russellville G	2477	6.123	4.517	196	1.183	35.02	17	SPP	OKGE_4_MSA_OklahomaCity	8773	2.102	2.403	-781	-1.550	46.32	-317	11.3	3682	42%
PJM	PENELEC_2_MSA_DuBois_G	7753	2,724	1,196	568		44.34			_L NYISO_10 NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	11.3	6364	72%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,473	1,700	44.08	570	PJM	VAP_7_G	1371	4,179	303	-974	-1,741	55.16	-74	11.1	6696	76%
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13	533		PSEG_8_MSA_NewYork_G	8779	3,860	3,654	-1,066	-2,403	51.21	-479	11.1	8163	93%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	38.01	429		AP_7_MSA_Hagerstown- Martinsburg_L	8784	203	1,153	-662	-1,009	49.08	-285	11.1	7972	91%
										AP_7_MSA_Hagerstown-										
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923	2,287	38.10	643	PJM	Martinsburg_L	8784	203	1,153	-662	-1,009	49.08	-285	11.0	7964	91%
MISO	FE 9 MSA Weirton G	8628	1,860	112	1,220	1,808	38.10	401		AP_7_MSA_Hagerstown- Martinsburg_L	8784	203	1,153	-662	-1,009	49.08	-285	11.0	7935	90%
	NYISO_1_NYA	8323	4,946	2,500	1,595		40.13			PSEG_3_MSA_NewYork_L	8784	1,843		-879		51.11	-395	11.0	8179	93%
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359		38.79	2,167	PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798		49.61	-348	10.8	8108	92%
VACAR	CPLE_1_MSA_Durham_G	7555	10,224	8,563	940	2,730	44.48	316	PJM	VAP_7_G	1371	4,179	303	-974	-1,741	55.16	-74	10.7	5149	59%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,138	28.23	222	MISO	METC_9_MSA_Kalamazoo_L	8784	118	1,334	-760	-1,339	38.86	-260	10.6	5773	66%
	-									AEP_9_MSA_Canton-										
PJM	NI_7_MSA_Rochelle_G	8784	2,290	0 500	2,119	2,290	28.20		PJM	Massillon_L	8784	733	2,120	-1,414	-2,058	38.80	-482	10.6	6053	69%
	NEPOOL_3_ME AEP 8 GEN Amos01 G	3752 8784	3,494 19.694	2,522 6.544	297 6.359	1,074 10.066	46.10 38.79	2,167		NYISO_11_NYK VAP 33 MSA DC L	8784 8784	5,681 910	5,289 2,983	-1,869 -1,704	-2,703 -2,478	56.62 49.31	-930 -738	10.5 10.5	8783 8129	100% 93%
	0_02.1_/110301_0	0704	. 5,054	5,544	5,555	.0,000	50.73	2,107	. 5	00m.o. \_D0_L	0704	310	2,303	1,704	2,770	10.01	-730	10.5	3123	3370
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13			PSEG_5_MSA_Philadelphia_L	8784	2,143	2,766	-1,186	-2,037	50.63	-528	10.5	8198	93%
	NYISO_1_NYA	8323	4,946	2,500	1,595		40.13			NEPOOL_6_WCMA	8707	4,285 0	3,417	-1,409		50.54	-620	10.4	6361	72%
	AEP_8_GEN_Amos01_G IP_7_GEN_Baldwin_G	8784 8784	19,694 1,900	6,544 444	6,359 1,189		38.79 34.72	2,167 363		VAP_27_MSA_DC_L AMRN_12_MSA_StLouis_L	8784 2082	5,059	1,048 6,066	-641 -463	-1,075 -1,852	49.20 45.08	-277 -44	10.4 10.4	8079 1559	92% 18%
										AP_7_MSA_Hagerstown-										
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359		38.79	2,167		Martinsburg_L	8784	203	1,153	-662	-1,009	49.08	-285	10.3	8048	92%
	NYISO_1_NYA BREC_3_County_Webster_G	8323 8784	4,946 1,355	2,500 476	1,595 902	2,319 1,135	40.13 33.08			NEPOOL_4_NEBOS LGEE_5_MSA_Lexington_L	8631 8784	3,262 595	5,904 2,345	-1,262 -1,654	-3,970 -2,693	50.39 43.24	-549 -628	10.3	6361 7505	72% 85%
VIIOU	DIVEO 3 COUNTY AMERICAL CO.	0704	1,555	410	502	1,135	33.00	202	IVIIOU	LOLL_J_WIGH_LEXITIGIUII_L	0104	595	2,343	-1,034	-2,093	45.24	-020	10.2	1303	00%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion	Indicators	
Course ride ii					Average				OHIN TIGO HITO	matori				Average				Congocion	indicatoro	
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
M	Unit Mana	Source	Gen	Load	injection	injection	Price	surplus		Ulub Mana	Sink	Gen	Load	injection	injection	Price	surplus	Price		1100.07
Market Area NEPOOL	Hub Name NEPOOL_2_NH	Hours 8501	Weight 4,204	Weight 2,621	(MW) 1,014	(MW) 1,816	(\$/MWh) 48.52	(\$MM)	Market Area NEPOOL	Hub Name NEPOOL_7_CT	Hours 1117	Weight 4,447	Weight 3,920	(MW) -320	(MW) -1,094	(\$/MWh) 58.57	(\$MM) -21	Differential 10.0	U90 Hours 7577	U90 % 86%
	MEC_3_MSA_DesMoines_G	8009	3,307	1,933	939	1,547	24.54			AMRN 2 County Macon L	8784	174	1,209	-716	-1,132	34.55	-217	10.0	6315	72%
PJM	PENELEC_2_MSA_DuBois_G	7753	2,724	1,196	568	1,591	44.34			NYISO 9 NYI	8467	2	1,476	-786	-1,993	54.32	-362	10.0	6334	72%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62		9.8	8784	100%
										OKGE_4_MSA_OklahomaCity										
SPP	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60	100	SPP	_L	8773	2,102	2,403	-781	-1,550	46.32	-317	9.7	1940	22%
000					=0.4	4.070				OKGE_4_MSA_OklahomaCity	0770	0.400		704	4 550	40.00	0.17		4000	100/
SPP NYPP	AEPW_9_MSA_MountPleasant_0 NYISO_1_NYA	6984 8323	8,168 4,946	3,832 2,500	534 1,595	1,673 2,319	36.63 40.13		SPP NEPOOL	_L NEPOOL_10_RI	8773 6243	2,102 2,062	2,403 2,203	-781 -366	-1,550 -1,145	46.32 49.72	-317 -114	9.7 9.6	4330 6361	49% 72%
	NEPOOL 3 ME	3752	3,494	2,500	297		46.10	533		NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	9.6	8781	100%
NLFOOL	INEFOOL_3_WE	3132	3,434	2,022	231	1,074	40.10	31	INTEF	N1130_10_N13	0704	10,203	11,433	-3,730	-5,517	33.34	-1,033	3.4	0/01	100 /6
ENTERGY	EES_9_MSA_Russellville_G	2477	6,123	4,517	196	1,183	35.02	17	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	9.4	6807	77%
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896		28.23			METC_8_MSA_BayCity_G	8119	3,795	2,562	-538		37.60		9.4		67%
	NYISO_6_NYF	7778	4,103	1,983	618		49.25	237	NEPOOL	NEPOOL_7_CT	1117	4,447	3,920	-320		58.57		9.3	8747	100%
	XEL_3_MSA_Minneapolis_G	4129	7,596	7,622	812		17.84			GRE_4_MSA_Minneapolis_L	8784	331	1,111	-1,008	-1,827	27.10		9.3	0	0%
MISO	AMRN_12_MSA_StLouis_L	6702	5,059	6,066	757	1,937	31.17	158	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	9.2	5377	61%
ENTERGY	EES 9 MSA Russellville G	2477	6,123	4,517	196	1,183	35.02	17	SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	7678	3,431	4,125	-720	-2,899	44.18	-244	9.2	3674	42%
	AECI 4 GEN NewMadrid1 G	8784	2,315	248	1,168		36.21			AMRN_12_MSA_StLouis_L	2082	5.059	6,066	-463		45.08		8.9	2732	31%
MISO	NIPS_8_MSA_Chicago_G	8760	2,892	1,694	920	1,665	31.13	251	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	8.8	4899	56%
MISO	AMRN_12_MSA_StLouis_L	6702	5,059	6,066	757	1,937	31.17	158	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	8.8	7097	81%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762		NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	8.7	8782	100%
										OKGE_4_MSA_OklahomaCity										
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,952	2,769	37.86		SPP	AMBN 40 MOA Od sods 1	8773	2,102	2,403	-781 -463	-1,550	46.32	-317	8.5	5518	63%
MISO	TVA_4_MSA_Clarksville_G NIPS_8_MSA_Chicago_G	8616 8760	2,544 2,892	150 1,694	2,099 920	2,473 1,665	36.62 31.13	251		AMRN_12_MSA_StLouis_L AEP_2_STA_TN-WV_L	2082 8784	5,059 1,284	6,066 2,977	-463 -1,591	-1,852 -2,640	45.08 39.59	-44 -553	8.5 8.5	5995 1654	68% 19%
	AMRN_12_MSA_StLouis_L	6702	5,059	6,066	757	1,937	31.17			AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	-553	8.4	6856	78%
	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359		38.79	2,167	PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-494	-1,149	47.17	-205	8.4	8049	92%
	NEPOOL_3_ME	3752	3,494	2,522	297	1,074	46.10			NYISO_9_NYI	8467	2	1,476	-786	-1,993	54.32	-362	8.2	8753	100%
NEPOOL	NEPOOL_5_SEMA	8784	6,454	3,978	1,957		50.35			NEPOOL_7_CT	1117	4,447	3,920	-320		58.57		8.2	2719	31%
MISO	CIN_8_MSA_Evansville_G	8783	3,657	260	2,484		36.95			AMRN_12_MSA_StLouis_L	2082	5,059	6,066	-463	-1,852	45.08		8.1	2938	33%
NEPOOL	NEPOOL_2_NH	8501	4,204	2,621	1,014	1,816	48.52	418	NYPP	NYISO_11_NYK	8784	5,681	5,289	-1,869	-2,703	56.62	-930	8.1	8783	100%
SPP	AEPW 5 MSA Tulsa G	7062	4,226	2,571	388	1,209	36.60	100	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	7.8	7708	88%
OF F	ALF W_5_WSA_TUISA_G	7002	4,220	2,011	300	1,205	30.00	100	LIVILIOI	LL3_5_W3A_NewOrleans_G	0704	9,733	3,234	-2,030	-5,151	44.43	-1,120	7.0	7700	0076
SPP	AEPW 9 MSA MountPleasant 0	6984	8,168	3,832	534	1,673	36.63	137	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	7.8	8748	100%
			.,	.,		,,,,				AEP_9_MSA_Canton-		.,		,,,,						
MISO	NIPS_8_MSA_Chicago_G	8760	2,892	1,694	920	1,665	31.13	251		Massillon_L	8784	733	2,120	-1,414	-2,058	38.80	-482	7.7	1705	19%
										AEP_9_MSA_Canton-										
MISO	AMRN_12_MSA_StLouis_L	6702	5,059	6,066	757	1,937	31.17		PJM	Massillon_L	8784	733	2,120	-1,414	-2,058	38.80	-482	7.6	6336	72%
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,288	6,493	47.58	1,374	РЈМ	VAP_7_G SOCO 10 MSA Albany-	1371	4,179	303	-974	-1,741	55.16	-74	7.6	5353	61%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	662	SOUTHERN	Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	-244	7.6	5424	62%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496		35.70		MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1.654		43.24		7.5		56%
PJM	NI_15_MSA_Davenport_G	8670	2,479	0	1,728	2,314	27.04		MISO	AMRN_2_County_Macon_L	8784	174	1,209	-716	-1,132	34.55		7.5	6627	75%
PJM	PENELEC_2_MSA_DuBois_G	7753	2,724	1,196	568	1,591	44.34			NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85		7.5	6333	72%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762	NYPP	NYISO_9_NYI	8467	2	1,476	-786	-1,993	54.32	-362	7.5	8692	99%
ENTERGY	EEC 0 MCA Buscolleille C	2477	6 100	4.517	196	1 100	35.02	17	COLITHERN	COCO E CEN CEDCUY I	8784	2.098	2 402	-1,790	2 0 4 7	42.52	660	7.5	3708	420/
	EES_9_MSA_Russellville_G SOCO 32 MSA Pascagoula G	8110	6,123 3,574	2,674	578	1,183 1,690	41.22		FRCC	SOCO_5_GEN_GEPCHY_L FPL_7_MSA_Miami_L	8784 8784	2,098 570	3,403 3,923	-1,790	-2,847 -4,080	42.52 48.68	-668 -1,065	7.5	5710	42% 65%
COUTTIENT	OCCO_OZ_INIOA_I ascagoula_C	0110	3,374	2,014	370	1,000	71.22	100	1100	TT E_7_WOA_WIGHTI_E	0704	370	0,320	-2,400	4,000	40.00	-1,000	7.0	37 10	0070
ENTERGY	EES 9 MSA Russellville G	2477	6,123	4,517	196	1,183	35.02	17	SOUTHERN	SOCO 8 MSA Atlanta L	8784	0	1,925	-1,065	-1,811	42.46	-397	7.4	3787	43%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	FRCC	FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65	-817	7.4	5183	59%
ENTERGY	EES_9_MSA_Russellville_G	2477	6,123	4,517	196	1,183	35.02	17	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	7.4	3763	43%
ENTERGY	EES 9 MSA Russellville G	2477	6,123	4,517	196	1,183	35.02	47	COLITUEDN	SOCO 16 MSA Atlanta L	8784	694	3,058	-1,410	-2,740	42.42	-526	7.4	3508	40%
	NYISO 6 NYF	7778	4,103	1,983	618		49.25			NYISO_11_NYK	8784 8784	5,681	5,289	-1,410	-2,740	56.62	-930	7.4	8784	100%
NIFF	N1130_0_N11	1110	4,103	1,505	010	1,735	43.23	231	NIFF	NTISO_TT_NTK	0704	3,001	3,203	-1,005	-2,703	30.02	-930	7.4	0704	10078
ENTERGY	AECI 4 GEN NewMadrid1 G	8784	2.315	248	1,168	1,641	36.21	372	SPP	WERE 4 GEN Wolfcreek G	3632	3.510	2,459	-481	-1,564	43.55	-76	7.3	6992	80%
					.,							- /	,							
	EES_9_MSA_Russellville_G	2477	6,123	4,517	196	1,183	35.02			SOCO_21_MSA_Atlanta_G	8776	3,334	2,733	-1,117	-2,055	42.33	-415	7.3	3449	39%
MISO	BREC_3_County_Webster_G	8784	1,355	476	902	1,135	33.08	262		TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	7.3	7663	87%
ENTEROY	EEO O MOA Dura-likilla C	0.4	0.400	4.545	400	4 400	05.00			SOCO_6_MSA_Augusta-	0701		4.467	057	4.440	40.07			2001	0501
	EES_9_MSA_Russellville_G NI_2_MSA_Chicago_G	2477 8784	6,123	4,517 1,283	196 3,498	1,183 4,181	35.02	1,006		Richmond_L AEP_1_MSA_Lynchburg_G	8784 8784	843	1,187 2.162	-657 -1,529	-1,116	42.27 39.95		7.2 7.2	3061 5573	35%
	NEPOOL_2_NH	8784 8501	5,342 4,204	2,621	1,014	1,816	32.75 48.52			NYISO_10_NYJ	8784 8784	10,283	11,493	-1,529	-2,299 -5,317	55.54	-1,833	7.2	8784	63% 100%
502	502_2	5001	1,204	2,021	1,014	1,010	10.02	710			0,04	. 5,205	. 1,755	3,730	3,517	33.34	1,000	7.0	3704	. 30 /8
SPP	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60			WERE_4_GEN_Wolfcreek_G	3632	3,510	2,459	-481	-1,564	43.55	-76	7.0	3839	44%
	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76	771	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,490	-4,080	48.68	-1,065	6.9	5394	61%
	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76			FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65		6.9	4788	55%
	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,342		41.83			FPL_7_MSA_Miami_L	8784	570	3,923	-2,490	-4,080	48.68		6.8	5384	61%
PJM SOUTHERN	NI_2_MSA_Chicago_G	8784 8616	5,342	1,283	3,498 1,342	4,181 1,917	32.75 41.83	1,006		AEP_2_STA_TN-WV_L FPL 3 MSA Miami L	8784 8783	1,284 6,944	2,977 7,089	-1,591	-2,640	39.59 48.65	-553	6.8	2757 4786	31%
	SOCO_28_MSA_Birmingham_G NI_15_MSA_Davenport_G	8616 8670	2,535 2,479	1,090	1,342	2,314	41.83 27.04	484 40E		NI_6_MSA_Miami_L NI_6_MSA_Chicago_G	8783 463	9,759	7,089	-1,913 -232	-4,084 -1,050	33.83	-817 -4	6.8	5713	54% 65%
PJM	NI_6_MSA_Chicago_G	8321	9,759	7,577	1,720	3,034	33.17			AEP_1_MSA_Lynchburg_G	8784	9,759	2,162	-1,529	-2,299	39.95		6.8	5586	64%
. 5	morooagoo	55Z I	3,733	.,017	1,110	5,034	30.17	500	. 2		0,04	0-0	2,102	1,023	2,200	55.55	-557	0.0	3300	U+70

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

No.   Section   No.	Source Hub Ir	formation								Sink Hub Info	mation								Congestion Inc	dicators	
Marchan   Part   Marchan																			- January - I		
Note   Property   Pr			_	_																	
PART - PARSON J. M.S. PRINCIPLE, D. 1978   1709   1	Market Area	Llub Nama								Market Area	Liub Nama									00 Hours	1100.0/
Care	Walket Alea	nub Name	Hours	weigni	vveigni	(IVIVV)	(IVIVV)	(\$/1010011)	(\$IVIIVI)			Hours	weigni	weigni	(IVIVV)	(IVIVV)	(\$/IVIVVII)	(DIVIIVI)	Dillerential	90 Hours	090 %
Outstand   Contract Number   First   Contract Number   Contract	PJM	PJM500_3_MSA_Pittsburgh_G	8758	1,705	0	1,368	1,700	43.76	524 F			8784	0	1,186	-681	-1,226	50.49	-302	6.7	7768	88%
## SPOCAL FOR PROPERTY OF THE		AP_1_County_Harrison_G				2,424							0			-1,492					
9.29 P. A. S. M. M. P. A. M. P. M. P. A. M. P. M. P. A. M		TVA_4_MSA_Clarksville_G																			
949 1480 J. S.S. Disson, D. 679 1570 1570 1570 1570 1570 1570 1570 1570																					
1969    1969	PJIVI	NI_20_WSA_CHICAGO_G	1234	1,032	63	090	1,571	33.43	217			0/04	043	2,102	-1,529	-2,299	39.93	-53/	6.5	3019	04%
SCHTMEN SOC. 28 MAX. Name. (a) 6784 (1982) 600 (1984) 6360 (1984) 6460 (1984)	PJM	PJM500 3 MSA Pittsburgh G	8758	1.705	0	1.368	1.700	43.76	524 F			8784	845	1.565	-578	-1.460	50.26	-255	6.5	7730	88%
AMOR J. M. S. P. M. P. S. P. S	SOUTHERN				0			42.24	1,895 F				570						6.4		
PART N. J. M. S. Deller, D. 1971 J. 1970 J. 1971 J. 1970 J. 1971 J. 1970 J. 1971 J. 1970 J. 1971 J. 19																					
SAMES PARTING MASS PRINCIPLE OF THE PART O					0																
PART PARTS & MAR PRESUNÇ G. 974 1770	РЈМ	NI_6_MSA_Chicago_G	8321	9,759	7,577	1,110	3,034	33.17	306 F			8784	1,284	2,977	-1,591	-2,640	39.59	-553	6.4	2758	31%
SOUTHERN SCOOL 26, 1865, March 0 1979	P IM	P IM500 9 MSA Pitteburgh G	8784	1 700	0	1 //73	1 700	44.08	570 6			8784	0	1 186	-681	-1 226	50.49	-302	6.4	7694	88%
Fig.					0								6.944								
SOLTHERM SOLD 31 MEAL ARBITURE 977 1776 1560 407 8.11 2 391 1500 PROC. PR. 7 MEAL ARBITURE 978 570 3.202 2.404 400 40.01 1.005 6.0 5.000 1770 1770 1770 1770 1770 1770 1770	PJM		8758	1,705	0		1,700		524 F			8784	0		-847	-1,492	50.14	-373	6.4	7445	
PART OF REPAIR APPROACH   1994					0																
NIPPS (D. A.M. P. WISS) G. WISS) G. A.M. P. WISS) G. A.M. P. WISS) G. A.M. P. WISS) G. A.M.																					
NEFFOX   SPECIAL   PROS. 5,2561.   PROS. 6,564   3678   1,807   3774   1776																					
SOUTHERN SCOOL SIARS, Alessens, G. 9772 11,785 1388 4697 8,815 42,38 1509 ROCC PR. 3, MAA, Meme L. 8779 6,944 7,090 1-191 4,094 640,0 6-277 6.2 4976 9784 PAMOS JAKS, Pathangh, G. 9784 1,770 4,77 170 4,10 579 PAM PAMOS JAKS, Pathangh, G. 9784 1,700 4,70 1,770 4,77 1,700 4,10 579 PAM PAMOS JAKS, Pathangh, G. 9794 1,700 4,70 1,70 1,70 4,70 1,70 1,70 4,70																					
Fig. M. AMORGO, S. MSA, Penbargo, G. 1978   1700   0   136   1700   0   478   526   M. P. Z. J.E.A., Alternoom, L. 1978   256   1501   664   1,002   4986   297   0   297   297   298   298   297   298   29																					
PAM   DARSON   MAS   Palbacyte   0.   Past   7.70   0   1.472   7.70   4.68   579   DAM   Toeson   1.   Past   5.68   5.78   7.460   5.05   2.56   5.05					0																
SOUTHERN SCOOL 22 MSA Pensagopia 0 810 3574 2874 578 1980 4122 198 PRCC FPL 2 MSA Frombers 0 8644 5589 4580 4780 4488 62 4489 595 874 1780 448 8 8 8 8 1571 330 217 9M ARC PLANT 1 874 1770 1 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																					
Fig.					0																
PAM PAMOO SMAR Pithology G 075 1,700																					
PAM   PAMSOD 9, MSA Pittsburgh 6  8784   1,700   0   1,472   1,700   4,00   570   PAM   Townson 1. 8784   253   1,602   5,000   1,325   5,017   5,50   6,176   8774   7,00   7,00   7,00   1,470   1,700   4,00   5,700   MA   PA 8 MSA DCWAHD 1. 8784   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,98   1,144   4,841   5,40   6   1,007   7,0	PJIVI	NI_20_WSA_CHICAGO_G	1234	1,032	03	090	1,571	33.43	217			0/04	1,204	2,911	-1,591	-2,040	39.39	-555	0.2	4471	51%
PAM   AP   L. County   Harriston G   5784   6,568   2222   2,424   3,069   43,51   326   BMA   Archago G   576	PJM	PJM500 9 MSA Pittsburgh G	8784	1,700	0	1,473	1,700	44.08	570 F			8784	263	1,462	-806	-1,325	50.17	-355	6.1	7634	87%
PAMSO 9 MSA Philadory G		AP_1_County_Harrison_G					3,969			PJM	AP_8_MSA_DC-VA-MD_L					-1,144		-348			
PM N 1.2 MSA, Chicago, G 6754 5.342 1.283 3.486 4.181 32.75 1.000 PJM Meep In Macro Meep In Me					1,694																
PAM   N. Z. MSA, Chicago C   6794   5.742   1,283   3,408   4,181   32,75   1,006   PAM   Massilion L   5774   733   2,100   1,414   2,068   38.0   4.85   6.0   2829   739.	PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,473	1,700	44.08	570 F			8784	0	1,439	-847	-1,492	50.14	-373	6.1	7419	84%
MISO AMEN, 12: MAS, Allsous, L. 6702 5,056 6,056 757 1,337 31,71 158/MISO CRI, 1,458, Longo, L. 8784 816 4,276 2,176 3,301 37.20 7.71 6.0 6287 77.94 MISO MAS, Demandor, L. 8784 2,306 1,056 34, 12,54 3,298 1,145 9,5 574 659. P.J.M. N. 15 MAS, Demandor, G. 870 2,479 0 1,728 2,314 27.04 405 P.J.M. N. 15 MAS, Chengo, L. 8784 2,306 1,056 3,262 1,051 3,296 1,1524 5,9 5,746 659. P.J.M. P.J.M. ORGAN, J. 15 MAS, Demandor, G. 8784 2,306 1,050 1	P IM	NI 2 MSA Chicago G	8784	5 3/12	1 283	3 / 108	A 181	32 75	1 006 5			8784	733	2 120	-1 /11/	-2.058	38.80	-482	6.0	2858	33%
PAM N. 15. MSA Devemport G 8870 2.478 0 1.728 2.314 27.04 405 PAM N. 3. MSA Chrisgop L 8784 20 1.205 433 -1.254 32.98 1.84 5.9 5746 65% PAM N. 3. MSA Devemport G 8764 1.700 0 1.728 2.314 27.04 405 PAM N. 3. MSA Chrisgop L 8784 2.380 1.056 5.322 4.015 1 32.06 1.1325 5.9 5746 65% PAM N. 3. MSA Devemport G 8764 1.700 0 1.478 1.700 4.06 570 PAM N. 3. MSA Devemport G 8764 1.001 4.00 5.000 1.728 2.244 1.001 0 1.000 1																			0.0		
PAM PAMSO 9 MSA Prisburgh G 8784 1,700 0 1,473 1,700 4 4.08 570 PAM PL7, MSA Allentown L 8784 245 1,051 6884 1,025 49.98 287 5.9 8389 995.  TVAUTHOR TVA 4, MSA Clark-wille, G 8616 1,665 44 1590 1,099 24.73 36.62 662 SOUTHERN SOCO 5 GEN GEPCHY L 8784 2,089 3,403 -1,790 2.847 42.52 688 5.9 5322 615.  PAM					0,000					PJM	NI 3 MSA Chicago L										
TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,098 2,473 36.62 662 SOUTHERN SOCO 5,GEN GEPCHY L 8764 2,008 3,403 -1,700 -2,847 42,52 -688 6,9 5322 615/misO ALTE 2 MSA Medicin G 8616 1,665 441 590 1,099 2.01 147 MISO XE 1,3 MSA Minneapolis G 4678 7,596 7,622 -683 2,214 34.89 -139 5,9 2141 295/misO ALTE 2 MSA Medicin G 8616 1,665 441 590 1,099 2,01 147 MISO XE 1,3 MSA Minneapolis G 4678 7,596 7,622 -683 2,214 34.89 -139 5,9 2141 295/misO ALTE 2 MSA MISO ALTE 2 MSA MINNEADOL B 70 1,097 -798 -1,144 4.861 -348 5.8 7723 86.62 662 SOUTHERN SOCO 8, MSA Alfanta L 8784 0 1,326 -1,065 -1,811 42,46 -397 5.8 5434 62% TVAUTHOR TVA 4, MSA Clarksville G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 3, MSA Alfanta L 8784 3 3,305 -1,828 3,110 42,45 -882 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 8, MSA Alfanta L 8784 3 3,305 -1,828 3,110 42,45 -882 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 8, MSA Alfanta L 8784 3 3,305 -1,828 3,110 42,45 -882 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 16, MSA Alfanta L 8784 3 3,305 -1,828 3,110 42,45 -882 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8616 3,056 1,410 2,740 42,42 -526 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8616 3,056 1,410 2,740 42,42 -526 5.8 5382 615/misO ALTE 2 MSA MSA CLARKSVILLE G 8784 1,500 2,500 2,473 36.62 662 SOUTHERN SOCO 16, MSA Alfanta L 8784 60 3,056 1,410 2,740 42,42 -526 5.8 6773 1005/misO ALTE 2 MSA MSA CLARKSVILLE G 8784 1,500 2,5	PJM	NI_15_MSA_Davenport_G			0		2,314	27.04			NI_13_MSA_Chicago_L		2,396	10,556	-5,262		32.96	-1,524		5746	65%
MISO ALTE 2 MSA, Madeison, G 8616 1,685 441 599 1,099 20.01 147/MISO XEL 3 MSA, Minnespolis, G 4678 7,696 7,692 -853 -2,814 34,89 1-39 5.9 2141 2496 PM P, MROSO 3, MSA, Patisburgh, G 8784 1,010 42.79 8879 PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 0 1,952 -1,066 -1,811 42.46 -397 5.8 5434 62% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 3,305 -1,826 -3,110 42.46 -662 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 694 3,058 1-1,406 -3,110 42.46 -662 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 694 3,058 1-1,406 -3,110 42.42 -566 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8784 5,000 1	PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,473	1,700	44.08	570 F	PJM	PL_7_MSA_Allentown_L	8784	245	1,051	-654	-1,025	49.98	-287	5.9	8369	95%
MISO ALTE 2 MSA, Madeison, G 8616 1,685 441 599 1,099 20.01 147/MISO XEL 3 MSA, Minnespolis, G 4678 7,696 7,692 -853 -2,814 34,89 1-39 5.9 2141 2496 PM P, MROSO 3, MSA, Patisburgh, G 8784 1,010 42.79 8879 PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 0 1,952 -1,066 -1,811 42.46 -397 5.8 5434 62% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 3,305 -1,826 -3,110 42.46 -662 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 694 3,058 1-1,406 -3,110 42.46 -662 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO, 8, MSA, Atlanta, L 8784 694 3,058 1-1,406 -3,110 42.42 -566 5.8 5382 61% PVAUTHOR TVA, 4, MSA, Clarksville, G 8784 5,000 1	TVALITHOR	TVA 4 MCA Clarkovilla C	0616	2 5 4 4	150	2 000	2 472	26.62	662	COUTHERN	COCO E CEN CEDCUY I	0704	2 000	2 402	1 700	2 0 4 7	42.52	660	F 0	E222	649/
PAMSO 3 MSA Pitsburgh G																					
TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 8 MSA Atlanta L 8784 0 1,925 -1,065 -1,811 42.46 -397 5.8 5434 62% TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 33 MSA Atlanta L 8784 3 3,305 -1,828 -3,110 42.45 -662 5.8 5382 61% 61% 61% 61% 61% 61% 61% 61% 61% 61%					0								7,550								
TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 33 MSA Atlanta L 8784 3 3,305 11,828 3.110 42.45 682 5.8 5382 61% TVAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,099 2,473 36.62 662 SOUTHERN SOCO 16 MSA Atlanta L 8784 684 3,058 11,410 2,740 42.42 526 5.8 5284 60% NEPOOL NEPOOL 2 NH 8501 4,204 2,621 1,014 1,816 48.52 418 NYPP NYISO 9, NYI 8467 2 1,476 7-786 1,1993 64.32 3462 6.8 8773 100% NEPOOL				•																	
TAUATHOR TVA 4_MSA Clarksville G 8616 2_544 150 2_099 2_473 86.62 662_SOUTHERN_SCOC_16_MSA_Atlanta L 8784 664 3_,058 1_,410 2_,740 4_242 -526 5_8 5_224 60% NEPOOL_	TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	662	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	42.46	-397	5.8	5434	62%
TAUATHOR TVA 4_MSA Clarksville G 8616 2_544 150 2_099 2_473 86.62 662_SOUTHERN_SCOC_16_MSA_Atlanta L 8784 664 3_,058 1_,410 2_,740 4_242 -526 5_8 5_224 60% NEPOOL_	TIMUTUOD	TVA 4 MOA OLESTER O	0040	0.544	450	0.000	0.470	00.00	000	COLITUEDA	0000 00 1404 44	0704		0.005	4 000	0.440	40.45	000	5.0	5000	040/
NEPOOL NEPOOL 2 NH	IVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	662 3	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	5.8	5382	61%
NEPOOL NEPOOL 2 NH	TVAUTHOR	TVA 4 MSA Clarksville G	8616	2.544	150	2.099	2.473	36.62	662 5	SOUTHERN	SOCO 16 MSA Atlanta L	8784	694	3.058	-1.410	-2.740	42.42	-526	5.8	5284	60%
PAM AP 1_County_Harrison G 8784 6,563 2,223 2,424 3,369 43.51 926 PIM VAP 33 MSA_DC_L 8784 910 2,983 1,704 4,278 49.31 -738 5.8 7654 87% NEPOOL 3.ME 3752 3,444 2,522 297 1,074 46.10 51 NYPP NYSO 7,NYG 8420 3,156 2,195 -7.32 1,477 51.85 -320 5.8 1613 70% 10.0 51 NYPP NYSO 7,NYG 8420 3,156 2,195 -7.32 1,477 51.85 -320 5.8 1613 70% 10.0 51 NYPP NYSO 7,NYG 8420 3,156 2,195 -7.32 1,477 2,249 49.31 -7.38 5.8 7654 87% 10.0 51 NYPP NYSO 7,NYG 8420 3,156 2,195 -7.32 1,477 2,249 49.31 -7.38 5.8 750 1.0 51 NYPP NYSO 7,NYG 8420 3,156 2,195 -7.32 1,477 2,249 49.91 4.0 1,0 4.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1													2								
TVAUTHOR TVA 4 MSA Clarksville G 8616 2.544 150 2.099 2.473 36.62 662 SOUTHERN SCCO 21 MSA Atlanta G 8776 3.334 2.733 -1.117 2.055 42.33 -415 5.7 5274 60% SOUTHERN SCCO 32 MSA Pascagoula, G 8110 3.574 2.674 578 1.680 41.22 193 FRCC FPC 4 MSA Tampa L 8784 2.239 2.873 -1.477 -2.2349 46.91 -609 5.7 4648 53% P.M AP 1_County, Harrison G 8784 6.563 2.223 2.424 3.969 43.51 926 P.M VAP 27 MSA D.C.  8784 0 1.048 -641 -1.075 49.20 -2.777 5.7 7581 88% SCCO 6 MSA Augusta-VALVE CONTROL OF A COUNTY AND A COUNTY, HARRISON G 8.654 1.50 2.099 2.473 36.62 662 SOUTHERN SCCO 6 MSA Augusta-VALVE CONTROL OF A COUNTY A MSA Clarksville G 8616 2.544 150 2.099 2.473 36.62 662 SOUTHERN SCCO 6 MSA Augusta-VALVE CONTROL OF A COUNTY A MSA Clarksville G 8616 2.544 150 2.099 2.473 36.62 662 SOUTHERN SCCO 6 MSA Augusta-VALVE CONTROL OF A COUNTY A MSA Clarksville G 8616 2.544 150 2.099 2.473 36.62 662 SOUTHERN SCCO 6 MSA Augusta-VALVE CONTROL OF A MSA Clarksville G 8784 2.290 0 2.119 2.200 12.2					2,223														0.0		
SOUTHERN SOCO 32_MSA_Pascagoula_G	NEPOOL	NEPOOL_3_ME	3752	3,494	2,522	297	1,074	46.10	51 N	NYPP	NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	5.8	6131	70%
SOUTHERN SOCO 32_MSA_Pascagoula_G	T\/ALITHOD	TVA 4 MSA Clarkevilla G	9616	2 544	150	2 000	2 472	26.62	662	COLITHEDA	SOCO 21 MSA Atlanta G	9776	2 224	2 722	1 117	2.055	12.22	415	5.7	5274	60%
PAM   AP   1 County   Harrison   G   8784   6.563   2.223   2.424   3.969   43.51   926   PAM   VAP   27 MSA   DC   L   8784   0   1,048   -641   -1,075   49.20   -277   5.77   7581   86%   SCOC 6 MSA   Augusta- SCOC 6																					
TAUTHOR TVA 4 MSA Clarksville G 8616 2,544 150 2,099 2,473 36,62 662 SOUTHERN Richmond L 8784 0 1,187 657 -1,116 42,27 -244 5,6 5366 619   PJM PENELEC 2 MSA DuBois G 7753 2,724 1,196 568 1,591 44,34 195 PJM PL 7 MSA Allentown L 8784 245 1,051 654 -1,025 49,98 -287 5,6 7760 88%   PJM PENELEC 2 MSA DuBois G 7753 2,724 1,196 568 1,591 44,34 195 PJM PL 7 MSA Allentown L 8784 245 1,051 654 -1,025 49,98 -287 5,6 7760 88%   PJM NI 6 MSA Chicago G 463 9,759 7,577 -232 -1,050 33,83 4 5,6 5133 55%   AEP 9 MSA Canton PJM NI 6 MSA Chicago G 8824 9,759 7,577 1,111 3,034 33,17 306 PJM Massillon L 8784 5,99 4,563 1,016 -2,545 47,39 4,06 5,6 4362 50%   MISO WEC 1 MSA Dimingham G 8695 12,464 9,217 2,123 5,257 41,76 771 FRCC FPL 2 MSA FortMyers G 8464 5,929 4,563 1,016 -2,545 47,39 4,06 5,6 4362 50%   MISO WEC 1 MSA Chicago G 8784 1,728 303 896 1,138 28,23 222 PJM NI 6 MSA Chicago G 463 9,759 7,577 -232 1,050 33,83 4 5,6 4502 51%   PJM AP 1 County Harrison G 8784 6,563 2,223 2,44 3,969 43,51 996 PJM Martinsburg L 8784 203 1,153 -662 1,009 49,08 -285 5,6 7603 87%   SOUTHERN SOCO 28 MSA Birmingham G 8616 2,535 1,090 13,342 1,917 41,83 484 FRCC FPL 2 MSA FortMyers G 8464 5,929 4,563 1,018 -2,545 47,39 4,008 5,6 4380 50%   PJM PJM500 9, MSA Pittsburgh G 8756 1,705 0 1,368 1,700 43,76 524 PJM VAP 33 MSA DC L 8784 910 2,983 -1,704 2,478 49,31 -738 5,5 7762 88%   NEPOOL NEPOOL 7 CT 7667 4,447 3,920 690 1,740 40,18 570 PJM AP 8 MSA DC VAMD L 8784 0 1,028 1,144 49,61 -349 5,5 7762 88%   PJM PJM500 3, MSA Pittsburgh G 8758 1,705 0 1,368 1,700 43,76 524 PJM VAP 27 MSA DC L 8784 0 1,048 -641 -1,075 49,20 -277 5,4 7587 100%   PJM PJM500 3, MSA Pittsburgh G 8758 1,705 0 1,368 1,700 43,76 524 PJM VAP 27 MSA DC L 8784 0 1,048 -641 -1,075 49,20 -277 5,4 7587 100%   PJM PJM500 3, MSA Pittsburgh G 8758 1,705 0 1,368 1,700 43,76 524 PJM VAP 27 MSA DC L 8784 0 1,048 -641 -1,075 49,20 -277 5,4 7587 100%   PJM PJM500 3, MSA Pittsburgh G 8758 1,705 0 1,368 1,700 43,76 524 PJM VAP 27 MSA DC L 8784 0 1,048 -641 -1,075 49,20 -277 5,4 7587 100%   PJM PJM50			8784					43.51				8784	0				49.20	-277	5.7		
P.JM PENELEC 2 MSA DuBois G 7753 2 ,724 1,196 568 1,591 44.34 195 P.JM PL.7 MSA Allentown L 8784 245 1,051 -654 -1,025 49.98 -287 5.6 7760 88% P.JM NI, 7 MSA Rochelle G 8784 2,290 0 2,119 2,290 28.20 525 P.JM NI, 6 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 5133 55% AEP.9 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 5133 55% AEP.9 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 5133 55% AEP.9 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 5133 55% AEP.9 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 2955 34% SOUTHERN SOCO 15 MSA Birmingham G 8695 12,464 9,217 2,123 5,257 41.76 771 FRCC FPL 2 MSA FortMyers G 8464 5,929 4,563 -1,018 -2,545 47.39 -408 5.6 4362 50% MISO WEC 1 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 4502 51% AIR ALL ALL ALL ALL ALL ALL ALL ALL ALL AL											SOCO_6_MSA_Augusta-										
P.JM   N.   T.   M.   N.   T.   M.   A.   Canton-   A.   F.   C.   C.   F.   C.   C.   F.   C.   C													0								
PM NI 6 MSA Chicago G 821 9,759 7,577 1,110 3,034 33.17 306 PJM Massillon L 8784 733 2,120 -1,414 -2,058 38.80 -482 5.6 2955 34% SOUTHERN SOCO 15 MSA Birmingham G 8695 12,464 9,217 2,123 5,257 41.76 771 FRCC FPL 2 MSA FortMyers G 8464 5,929 4,563 -1,018 -2,545 47.39 -408 5.6 4382 50% MISO WEC 1 MSA Chicago G 8784 1,728 303 896 1,138 28.23 222 PJM NI 6 MSA Chicago G 463 9,759 7,577 -232 -1,050 33.83 -4 5.6 4502 51% PJM AP _1_County_Harrison_G 8616 2,535 1,090 1,342 1,917 41.83 484 FRCC FPL 2 MSA FortMyers G 8464 5,929 4,563 -1,018 -2,545 47.39 -408 5.6 4502 51% PJM PJMS00 3, MSA Pittsburgh G 8784 1,705 0 1,388 1,700 43.76 524 PJM VAP 3,3 MSA DC L 8784 910 2,983 -1,704 2,478 49.31 -738 5.5 7762 88% NEPOOL NEPOOL 7 CT 7667 4,447 3,920 690 1,740 50.04 286 NYPP NYISO 10 NYJ B 8784 10,283 11,493 -3,758 5,54 -1,833 5.5 8767 100% PJM PJMS00 3, MSA Pittsburgh G 8758 1,705 0 1,388 1,700 43.76 524 PJM VAP 2,7 MSA DC L 8784 10,283 11,493 -3,758 5,54 -1,833 5.5 8775 100% PJM PJMS00 3, MSA Pittsburgh G 8758 1,705 0 1,388 1,700 44.08 570 PJM AP 8 MSA DC VA-MD L 8784 0 1,093 7,798 -1,144 49.61 -348 5.5 7779 88% NEPOOL NEPOOL 7 CT 7667 4,447 3,920 690 1,740 50.04 265 NYPP NYISO 10 NYJ 8784 10,283 11,493 -3,758 5,517 5554 -1,833 5.5 8775 100% PJM PJMS00 3, MSA Pittsburgh G 8758 1,705 0 1,388 1,700 43.76 524 PJM VAP 2 MSA DC L 8784 405 1,524 692 -1,141 51.52 -313 5.4 8767 100% PJM NI_20 MSA Chicago G 7234 1,632 83 896 1,571 33.43 217 PJM Massillon L 8784 405 1,556 4,023 40.36 -538 5.3 5901 67% PJM Massillon L 8784 NJA PJMSA RUSSEIWIR G 2477 6,123 4,517 196 1,183 35.02 17 PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM PJM Massillon L 8567 9,154 8,858 -1,556 4,023 40.36 -538 5.3 5901 67% PJM PJM Massillon L 8567 9,154 8,858 -1,556			7753		1,196								245	1,051							
P.JM   N. 6 MSA Chicago G   8321   9,759   7,577   1,110   3,034   33.17   366 P.JM   Massillon L   8784   733   2,120   -1,414   2,058   38.80   -482   5.6   2955   34%   50UTHERN   50CO_15 MSA_Birmingham_G   8695   12,464   9,217   2,123   5,257   41,76   771   FRCC   FPL_2MSA_FortMyers_G   8464   5,929   4,563   -1,016   -2,545   47,39   -408   5.6   4382   50%     MISO   WEC_1 MSA_Chicago G   8784   1,728   303   886   1,138   28.23   222 P.JM   NI 6 MSA_Chicago G   463   9,759   7,577   -232   -1,050   33.83   -4   5.6   4382   50%     P.JM   AP_1_County_Harrison_G   8784   6,563   2,223   2,424   3,969   43.51   926 P.JM   Martinsburg_L   8784   203   1,153   -662   -1,009   49.08   -285   5.6   7603   87%     SOUTHERN SOCO_28 MSA_Birmingham_G   8616   2,535   1,090   1,342   1,917   41.83   484   FRCC   FPL_2 MSA_FortMyers_G   8464   5,929   4,563   -1,018   -2,545   47.39   -408   5.6   4380   50%     P.JM   P.JM500_9 MSA_PIttsburgh_G   8784   1,700   0   1,473   1,700   44.08   570 P.JM   AP_8_MSA_DC_VA-MD_L   8784   0   1,097   -798   -1,144   49.61   -348   5.5   7762   88%     NEPOOL   NEPOOL_7_CT   7667   4,447   3,920   690   1,740   50.04   256 NPP   NYISO_10_NYJ   8784   40.5   1,524   -692   -1,141   51.52   -313   5.4   8767   100%     P.JM   NI_20_MSA_PIttsburgh_G   8758   1,705   0   1,368   1,704   43.76   524 P.JM   VAP_23_MSA_DC_L   8784   405   1,243   -408   5.5   7775   88%     NEPOOL   NEPOOL_3_ME   3752   3,494   2,522   297   1,074   46.10   51 NEPOOL   NEPOOL_9_NWKST   8784   405   1,524   -692   -1,141   51.52   -313   5.4   8767   100%     P.JM   NI_20_MSA_Chicago_G   7234   1,632   83   896   1,571   33.43   217 P.JM   Massilion_L   8784   405   1,524   -692   -1,141   -2,058   38.80   -482   5.4   2963   34%     ENTERGY   EES_9_MSA_Russeliville   40.2477   6.123   4.517   196   1,183   35.02   17 TAUTHOR   TVA_5_MSA_Nageritour-	FJIVI	INI_/_IVISA_KOCHEIIE_G	8/84	2,290	0	2,119	2,290	28.20	525 1		AED 9 MSA Canton-	463	9,759	1,5//	-232	-1,050	33.83	-4	5.6	5133	58%
SOUTHERN SOCO_15_MSA_Birmingham_G	РЈМ	NI 6 MSA Chicago G	8321	9,759	7.577	1,110	3.034	33,17	306 F			8784	733	2,120	-1,414	-2.058	38,80	-482	5.6	2955	34%
P.M. AP_1_County_Harrison_G	SOUTHERN							41.76					5,929						5.6		50%
P.JM   P.J.   County, Harrison G   8784   6.653   2.223   2.424   3.969   43.51   926   P.JM   Martinsburg, L   8784   203   1.153   -662   -1.009   49.08   -285   5.6   7603   87%   50UTHERN   SOCO_28 MSA_Bimingham G   8616   2.535   1.090   1.342   1.917   41.83   484   FRCC   FPL_2MSA_FortMyers G   8464   5.929   4.563   -1.018   -2.478   49.31   -7.38   5.5   7762   88%   P.JM   P.JMS00_3 MSA_Pittsburgh, G   8784   1.700   0   1.473   1.700   43.76   524   P.JM   VAP_33 MSA_DC_L   8784   910   2.983   -1.704   -2.478   49.31   -7.38   5.5   7762   88%   P.JM   P.JMS00_3 MSA_PIttsburgh, G   8784   1.700   0   1.473   1.700   44.08   570   P.JM   AP_8 MSA_DC-VA-MD_L   8784   0   1.097   -7.98   1.144   49.61   -348   5.5   7719   88%   NEPOOL   NEPOOL_3 MSA_PIttsburgh, G   8758   1.705   0   1.368   1.700   43.76   524   P.JM   VAP_27_MSA_DC_L   8784   0   1.028   11.493   -3.758   -5.317   55.54   -1.833   5.5   8775   100%   NEPOOL_3 ME   3752   3.494   2.522   297   1.074   46.10   51   NEPOOL_5 NEPOOL_9 NVIKST   8784   405   1.524   -692   -1.141   51.52   -313   5.4   8767   100%   AP_9_MSA_Canton-BMA_Russellville G   2477   6.123   4.517   196   1.183   35.02   17   TAUTHTOR TVA_5 MSA_Nashville L   8567   9.154   8.858   -1.556   -4.023   40.36   -538   5.3   5901   67%   AP_7_MSA_Lagerstown-BMA_Russellville G   2477   6.123   4.517   196   1.183   35.02   17   TAUTHTOR TVA_5 MSA_Nashville L   8567   9.154   8.858   -1.556   -4.023   40.36   -538   5.3   5901   67%   AP_7_MSA_Lagerstown-BMA_Russellville G   2477   6.123   4.517   196   1.183   35.02   17   TAUTHTOR TVA_5 MSA_Nashville L   8567   9.154   8.858   -1.556   -4.023   40.36   -538   5.3   5901   67%   AP_7_MSA_Lagerstown-BMA_Russellville G   2477   6.123   4.517   196   1.183   35.02   17   TAUTHTOR TVA_5 MSA_Nashville L   8567   9.154   8.858   -1.556   -4.023   40.36   -538   5.3   5901   67%   AP_7_MSA_Lagerstown-BMA_Russellville G   2477   6.123   4.517   4.2268   4.2268   4.2268   4.2268   4.2268   4.2268   4.2268   4.2268   4.2268   4	MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,138	28.23	222 F			463	9,759	7,577	-232	-1,050	33.83	-4	5.6	4502	51%
SOUTHERN SOCO 28 MSA Birmingham G 8616 2.535 1,990 1,342 1,917 41.83 484 FRCC FPL 2 MSA Forthlyers G 8464 5,929 4,563 -1,016 -2,545 47.39 -408 5.6 4380 50% FM PJMS00 3 MSA Pittsburgh G 8758 1,705 0 1,368 1,700 44.08 570 PJM VAP 33 MSA DC L 8784 910 2,983 -1,704 -2,478 49.31 -738 5.5 7762 88% PJM VAP 33 MSA DC L 8784 0 1,097 -798 -1,144 49.61 -348 5.5 7719 88% NEPOOL NEPOOL 7. CT 7667 4,447 3,920 690 1,740 50.04 265 NYPP NYISO 10,NYJ 8784 10,283 11,493 -3,758 5.54 -1,833 5.5 8775 100% PJM PJMS00 3 MSA Pittsburgh G 8758 1,705 0 1,368 1,700 43.76 524 PJM VAP 27 MSA DC L 8784 0 0 1,097 -798 -1,144 49.61 -348 5.5 7719 88% NEPOOL NEPOOL 7. CT 9 7667 4,447 3,920 690 1,740 50.04 265 NYPP NYISO 10,NYJ 8784 10,283 11,493 -3,758 5.54 -1,833 5.5 8775 100% NEPOOL NEPOOL 3 ME 3752 3,494 2,522 297 1,074 46.10 51 NEPOOL NEPOOL 9,NWKST 8784 405 1,524 -692 -1,141 51.52 -313 5.4 8767 100% PJM NI_20_MSA_Chicago G 7234 1,632 83 896 1,571 33.43 217 PJM Massillon L 8784 733 2,120 -1,414 -2,058 38.80 -482 5.4 2963 34% ENTERGY EES 9.MSA Russellville G 2477 6,123 4,517 196 1,183 35.02 17 TAUTHOR TVA_5 MSA_Nageristour-9	D.114	AD 4 County Harrison C	0701	0.500	0.000	0.401	0.000	40.51	000			0701	000	4.450	000	4.000	40.00	005	5.6	7000	0701
P.JMS   P.JMS00   S.MSA   Pittsburgh   G   F758   1,705   0   1,368   1,700   43.76   524   P.JM   VAP   3.MSA   DC   L   8784   910   2,983   -1,704   -2,478   49.31   -738   5.5   7762   88%   P.JMS00   P.JMSA   Pittsburgh   G   8784   1,700   0   1,473   1,700   44.08   570   P.JM   AP   8.MSA   DC-VA-MD   L   8784   0   1,693   1,798   -1,798   -1,144   49.61   -348   5.5   7719   88%   REPOOL   7.05   7.0																			0.0		
PJM PJMS00 9 MSA Pittsburgh G 8784 1,700 0 1,473 1,700 44.08 570 PJM AP 8 MSA DC-VA-MD_L 8784 0 1,097 -798 1,144 49.61 348 5.5 7719 88% NEPOOL NEPOOL 7 CT 7667 4,447 3,920 690 1,740 50.04 265 NYPP NYISO_10 NYJ 8784 10,283 11,493 -3,758 -5,317 55.54 -1,833 5.5 8775 100% PJM PJMS00 3,MSA Pittsburgh G 8785 1,705 0 1,368 1,700 43.76 524 PJM VAP_27_MSA_DC_L 8784 0 1,048 641 -1,075 49.20 2.77 5.4 7587 86% NEPOOL NEPOOL 3 ME 3752 3,494 2,522 297 1,074 46.10 51 NEPOOL NEPOOL_9 NWKST 8784 405 1,524 -692 -1,141 51.52 -313 5.4 8767 100% PJM NI_20_MSA_Chicago G 7234 1,632 83 896 1,571 33.43 217 PJM Massillon L 8784 733 2,120 -1,414 -2,058 38.80 -482 5.4 2963 34% ENTERGY EES_9 MSA Russeliville G 2477 6,123 4,517 196 1,183 35.02 17 TVAUTHOR TVA_5 MSA_Nashville L 8567 9,154 8,858 -1,556 -4,023 40.36 -538 5.3 5901 67%					1,090																
NEPOOL 7.CT 7667 4.447 3.920 690 1.740 50.04 265 NYPP NYISO 10 NYJ 8784 10.283 11.493 -3.758 -5.317 55.54 -1.833 5.5 8775 100% PJM					0								0								
NEPOOL NEPOOL_3_ME 3752 3,494 2,522 297 1,074 46.10 51 NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEPOOL_NEWST 8784 405 1,524 -692 -1,141 51.52 -313 5.4 8767 100% AEP_9_MSA_Canton-Nepool_NEPOOL_NEWST 8784 405 1,524 -692 -1,141 51.52 -313 5.4 8767 100% AEP_9_MSA_Canton-Nepool_NEPOOL_NENOOL_NEPOOL_	NEPOOL	NEPOOL_7_CT	7667	4,447	3,920	690	1,740	50.04	265	NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	5.5	8775	100%
PJM NI_20_MSA_Chicago_G 7234 1.632 83 896 1.571 33.43 217 PJM Massillon_L 8784 733 2,120 -1,414 -2,058 38.80 -482 5.4 2963 34% ENTERGY EES_9_MSA_Russeliville_G 2477 6,123 4,517 196 1,183 35.02 17 TVAUTHOR_TVA_5_MSA_Nashville_L 8567 9,154 8,858 -1,556 -4,023 40.36 -538 5.3 5901 67% AP_T_MSA_Hagerstown-					0									.,							
PJM NL_20_MSA_Chicago_G 7234 1.632 83 896 1.571 33.43 217 PJM Massillon_L 8784 733 2.120 -1.414 -2.058 38.80 -482 5.4 2963 34% ENTERGY EES_9_MSA_Russeliville_G 2477 6.123 4.517 196 1.183 35.02 17 TVAUTHOR_TVA_5_MSA_Nashville_L 8567 9.154 8.858 -1.556 -4.023 40.36 -538 5.3 5901 67% AP_7_MSA_Hagerstown-	NEPOOL	NEPOOL_3_ME	3752	3,494	2,522	297	1,074	46.10	51 N			8784	405	1,524	-692	-1,141	51.52	-313	5.4	8767	100%
ENTERGY EES 9 MSA Russeliville G 2477 6,123 4,517 196 1,183 35.02 17 TVAUTHOR TVA 5 MSA Nashville L 8567 9,154 8,858 -1,556 -4,023 40.36 -538 5.3 5901 67% AP_7 MSA_Hagerstown-	P IM	NI 20 MSA Chicago G	7224	1 622	02	900	1 574	22 42	217			0704	722	2 120	_4 /44 /4	-2 050	20 00	400	E 4	2062	2/10/
AP_7_MSA_Hagerstown-																					
PJM  PJM500_3_MSA_Pittsburgh_G   8758   1,705   0   1,368   1,700   43.76   524 PJM   Martinsburg_L   8784   203   1,153   -662   -1,009   49.08   -285   5.3   7617   87%			2411	0,123	7,017	130	۰,۱۰۰	30.02	.,,		AP_7_MSA_Hagerstown-	0007	5,154	0,000	1,000	4,023	+0.30	-330	0.0	3301	07.70
	PJM	PJM500_3_MSA_Pittsburgh_G	8758	1,705	0	1,368	1,700	43.76	524 F	PJM	Martinsburg_L	8784	203	1,153	-662	-1,009	49.08	-285	5.3	7617	87%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub In	formation							Sink Hub Info	rmation								Congestion Indic	ators	
					Average net	Max net	Average	Revenue					Average net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus		Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM) Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential U90	Hours	U90 %
ENTERGY	EES_8_MSA_BatonRouge_G	8520	1,060	0	1,059	1,060	39.11	353 ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	5.3	5064	58%
NYPP	NYISO_8_NYH	8784	2,021	973	1,581	1,945	53.25	740 NEPOOL	NEPOOL_7_CT	1117	4,447	3,920	-320	-1,094	58.57	-21	5.3	8753	100%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8784	2,199	163	1,342	1,697	39.15	461 ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2.890	-5.151	44.43	-1,128	5.3	6329	72%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1,700	0	1,473	1,700	44.08	570 PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,704	-2,478	49.31	-738	5.2	7786	89%
	NEPOOL_5_SEMA	8784	6,454	3,978	1,957	3,704	50.35	866 NYPP	NYISO_10_NYJ	8784	10,283	11,493	-3,758	-5,317	55.54	-1,833	5.2	8774	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G SOCO 26 MSA Macon G	8695 8784		9,217	2,123 5,108	5,257 6,282	41.76 42.24		FPC_4_MSA_Tampa_L FPL 2 MSA FortMyers G	8784 8464	2,239 5,929	2,873 4.563	-1,477 -1.018	-2,349 -2,545	46.91 47.39	-609 -408	5.1 5.1	4124 4535	47% 52%
	PJM500 9 MSA Pittsburgh G	8784		0	1,473	1,700	44.08		VAP 27 MSA DC L	8784	0,323	1,048	-641	-1,075	49.20	-277	5.1	7545	86%
						•													
	EES_9_MSA_Russellville_G SOCO 28 MSA Birmingham G	2477 8616	6,123 2,535	4,517 1,090	196 1,342	1,183 1,917	35.02 41.83	17 SOUTHERN 484 FRCC	SOCO_17_MSA_Mobile_G FPC 4 MSA Tampa L	7680 8784	5,205 2,239	4,575 2,873	-584 -1,477	-2,068 -2,349	40.12 46.91	-180 -609	5.1 5.1	3393 4125	39% 47%
	NYISO 6 NYF	7778	4,103	1,983	618	1,759	49.25		NYISO 9 NYI	8467	2,239	1,476	-1,477	-1,993	54.32	-362	5.1	8643	98%
	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762 NYPP	NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	5.0	5594	64%
MISO	CIN_3_MSA_TerreHaute_G	6968	3,230	1,015	796	2,234	38.21	212 MISO	LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,654	-2,693	43.24	-628	5.0	255	3%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38	1,508 FRCC	FPL_2_MSA_FortMyers_G AP_7_MSA_Hagerstown-	8464	5,929	4,563	-1,018	-2,545	47.39	-408	5.0	4375	50%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	1.700	0	1,473	1.700	44.08	570 PJM	Martinsburg_L	8784	203	1,153	-662	-1.009	49.08	-285	5.0	7607	87%
PJM	PJM500_7_MSA_York-Hanover_	8784	2,696	0	2,198	2,570	50.23		VAP_7_G	1371	4,179	303	-974	-1,741	55.16	-74	4.9	6054	69%
ENTERGY	EES 9 MSA Russellville G	2477	6,123	4,517	196	1,183	35.02	17 SPP	AEPW_9_MSA_MountPleasan t G	1800	8,168	3,832	-294	-1,361	39.92	-21	4.9	2759	31%
	CPLE_1_MSA_Russellville_G CPLE_1_MSA_Durham_G	7555	10,224	4,517 8,563	196 940	2,730	35.02 44.48		t_G VAP_33_MSA_DC_L	1800 8784	8,168 910	2,983	-1,704	-1,361 -2,478	39.92 49.31	-21 -738		7593	31% 86%
MISO	ALTE_2_MSA_Madison_G	8616	1,665	441	590	1,099	29.01	147 PJM	NI_6_MSA_Chicago_G	463	9,759	7,577	-232	-1,050	33.83	-4	4.8	6187	70%
PJM	PJM500_5_MSA_DC_G	8784	1,730	0	1,516	1,730	50.37	671 PJM	VAP_7_G	1371	4,179	303	-974	-1,741	55.16	-74		4880	56%
	NI_7_MSA_Rochelle_G NI 7 MSA Rochelle G	8784 8784	2,290 2,290	0	2,119 2,119	2,290	28.20 28.20		NI_3_MSA_Chicago_L NI_13_MSA_Chicago_L	8784 8784	26 2,396	1,205	-634	-1,254 -9,151	32.98 32.96	-184	4.8	5105 5083	58%
	WEC_1_MSA_Chicago_G	8784		303	896	2,290 1,138	28.23	525 PJM 222 PJM	NI_3_MSA_Chicago_L	8784	2,396	10,556 1,205	-5,262 -634	-1,254	32.98	-1,524 -184	4.8	4503	58% 51%
MISO	WEC_1_MSA_Chicago_G	8784		303	896	1,138	28.23		NI_13_MSA_Chicago_L	8784	2,396		-5,262	-9,151	32.96	-1,524	4.7	4502	51%
VACAR	CPLE_1_MSA_Durham_G	7555		8,563	940	2,730	44.48	316 PJM	VAP_27_MSA_DC_L	8784	0		-641	-1,075	49.20	-277	4.7	7300	83%
	NYISO_3_NYC PJM500_4_MSA_Philadelphia_G	8784 8496	6,711 2,383	2,657	1,852 1,449	3,064 2,346	46.81 50.48		NEPOOL_9_NWKST VAP_7_G	8784 1371	405 4,179	1,524 303	-692 -974	-1,141 -1,741	51.52 55.16	-313 -74	4.7 4.7	8769 5560	100% 63%
	SOCO_26_MSA_Macon_G	8784		0	5,108	6,282	42.24		FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,477	-2,349	46.91	-609	4.7	4283	49%
MISO	LGEE_3_GEN_Gehnt2_G	8784		225	1,496	1,895	35.70		TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538		6092	69%
ENTERGY			0.544		894					0704	0.705								700
	EES_10_MSA_Vicksburg_G SOCO 32 MSA Pascagoula G	8088 8110	3,544 3,574	1,249 2,674	578	1,236 1,690	39.85 41.22	288 ENTERGY 193 FRCC	EES_5_MSA_NewOrleans_G FPC 3 MSA Orlando L	8784 8784	9,735 1,232	9,294 3,649	-2,890 -1,853	-5,151 -3,468	44.43 45.78	-1,128 -745	4.6 4.6	6335 4143	72% 47%
CCCTTLLTAT	CCCC_CZ_INC/\_i accagouia_C	0110	0,011	2,071	0.0	1,000		100 1100	SOCO_10_MSA_Albany-	0.0.	1,202	0,010	1,000	0,100	10.70	7.10	1.0		
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62		Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	-244	4.6	536	6%
	SOCO_31_MSA_Atlanta_G EKPC_8_MSA_Maysville_G	8772 8784	11,765 1.396	1,583 272	4,057 927	8,815 1,366	42.38 38.73	1,508 FRCC 315 MISO	FPC_4_MSA_Tampa_L LGEE_5_MSA_Lexington_L	8784 8784	2,239 595	2,873 2,345	-1,477 -1,654	-2,349 -2,693	46.91 43.24	-609 -628	4.5 4.5	4123 1034	47% 12%
	AEP 8 GEN Amos01 G	8784	19,694	6,544	6,359	10,066	38.79		DUK 4 MSA Greenville L	6956	3,546	4,489	-1,034	-2,093	43.29	-186	4.5	5242	60%
									EES_7_MSA_Beaumont-										
	EES_9_MSA_Russellville_G	2477	6,123	4,517	196	1,183	35.02		PortArthur_G	6142	7,393	4,949	-435	-1,610	39.49	-105	4.5	6314	72%
	AEP_8_GEN_Amos01_G NEPOOL_3_ME	8784 3752	19,694 3,494	6,544 2,522	6,359 297	10,066 1,074	38.79 46.10		LGEE_5_MSA_Lexington_L NEPOOL 6 WCMA	8784 8707	595 4.285	2,345 3,417	-1,654 -1,409	-2,693 -3,954	43.24 50.54	-628 -620	4.4	83 6948	1% 79%
	NYISO 3 NYC	8784	6,711	2,657	1,852	3,064	46.81	762 PJM	PSEG 8 MSA NewYork G	8779	3,860	3,654	-1,066	-2,403	51.21	-479	4.4	7548	86%
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13	533 NEPOOL	NEPOOL_3_ME	5032	3,494	2,522	-208	-1,038	44.51	-47	4.4	6484	74%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	894	1,236	39.85	288 SOUTHERN	SOCO_10_MSA_Albany-	7678	3,431	4,125	-720	-2,899	44.18	-244	4.3	1789	20%
NEPOOL	NEPOOL_3_ME	3752		2,522	297	1,230	46.10		NEPOOL 4 NEBOS	8631	3,262	5,904	-1,262	-3,970	50.39	-549		6823	78%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762 PJM	PSEG_3_MSA_NewYork_L	8784	1,843	2,275	-879	-1,841	51.11	-395	4.3	7199	82%
	VAP_7_G	7413	4,179	303	1,507	3,629	45.32	506 PJM	AP_8_MSA_DC-VA-MD_L	8784	0	1,097	-798	-1,144	49.61	-348	4.3	5956	68%
	NEPOOL_7_CT EES 9 MSA Russellville G	7667 2477	4,447 6,123	3,920 4,517	690 196	1,740 1,183	50.04 35.02		NYISO_9_NYI EES 1 MSA Jackson L	8467 8784	3,218	1,476 3,066	-786 -1,233	-1,993 -2,026	54.32 39.26	-362 -425	4.3 4.2	8615 2320	98% 26%
	EES_9_MSA_Russellville_G	2477		4,517	196	1,183	35.02	17 TVAUTHOR	TVA_7_MSA_Memphis_L	8725	7,215	5,982	-1,233	-4,095	39.25	-425		1050	12%
	NIPS_8_MSA_Chicago_G	8760	2,892	1,694	920	1,665	31.13	251 MISO	CIN_7_MSA_Lafayette_L	8784	144	1,712	-851	-1,422	35.30	-264	4.2	1662	19%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,168	1,641	36.21	372 TVAUTHOR	TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	4.1	4764	54%
VACAR	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62	16 VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1.307	-2,681	44.75	-514	4.1	2603	30%
ENTERGY	EES_9_MSA_Russellville_G	2477		4,517	196	1,183	35.02		TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,211	-2,885	39.10	-416		3407	39%
	D.11500 T.1101 V	077	0.05				E0	070 5 114	DE00 = 1101 BUT 1 ::::		4.0	0.5		0.4:-	E4.5-	451			
	PJM500_7_MSA_York-Hanover_ SOCO 15 MSA Birmingham G	8784 8695	2,696 12,464	9,217	2,198 2,123	2,570 5,257	50.23 41.76	970 PJM 771 FRCC	PECO_5_MSA_Philadelphia_L FPC 3 MSA Orlando L	6985 8784	1,656 1,232	2,510 3,649	-424 -1,853	-2,442 -3,468	54.27 45.78	-161 -745	4.0	2626 3426	30% 39%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	38.01	429 MISO	FE_5_MSA_Cleveland_L	6639	3,216	4,680	-553	-2,419	42.00	-154		4675	53%
PJM	VAP_7_G	7413	4,179	303	1,507	3,629	45.32	506 PJM	VAP_33_MSA_DC_L	8784	910	2,983	-1,704	-2,478	49.31	-738	4.0	5947	68%
MISO MISO	ITC_7_MSA_Monroe_G	8712 8616	1,500	0 441	1,307 590	1,500	38.03	433 MISO 147 PJM	FE_5_MSA_Cleveland_L	6639 8784	3,216	4,680	-553 -634	-2,419	42.00 32.98	-154 -184	4.0	6366	72% 70%
NEPOOL	ALTE_2_MSA_Madison_G NEPOOL 5 SEMA	8616 8784	1,665 6,454	3,978	1,957	1,099 3,704	29.01 50.35		NI_3_MSA_Chicago_L NYISO 9 NYI	8784 8467	26	1,205 1,476	-634 -786	-1,254 -1,993	32.98 54.32	-184 -362		6159 8635	98%
PJM	NI_15_MSA_Davenport_G	8670	2,479	0	1,728	2,314	27.04	405 MISO	WEC_3_MSA_Milwaukee_G	7208	1,429	2,423	-320	-1,202	30.99	-72	4.0	4858	55%
	ALTE_2_MSA_Madison_G	8616		441	590	1,099	29.01	147 PJM	NI_13_MSA_Chicago_L	8784	2,396	10,556	-5,262	-9,151	32.96	-1,524	4.0	6158	70%
	SOCO_28_MSA_Birmingham_G	8616 8784	2,535 2,371	1,090 213	1,342 1,923	1,917 2,287	41.83 38.10	484 FRCC 643 MISO	FPC_3_MSA_Orlando_L FE_5_MSA_Cleveland_L	8784 6639	1,232 3,216	3,649 4,680	-1,853 -553	-3,468 -2,419	45.78 42.00	-745 -154	4.0 3.9	3428 4613	39% 53%
	FE_6_MSA_Pittsburgh_G FE 9 MSA Weirton G	8628	1,860	112	1,923	1,808	38.10		FE_5_MSA_Cleveland_L FE_5_MSA_Cleveland_L	6639	3,216	4,680	-553	-2,419	42.00	-154	3.9	4056	46%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496	1,895	35.70	469 PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	-553	3.9	4978	57%
PJM	VAP 7 G	7413	4,179	303	1,507	3,629	45.32	506 PJM	VAP_27_MSA_DC_L	8784	0	1,048	-641	-1,075	49.20	-277	3.9	5951	68%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion	Indicators	
Market Area	Hub Name	Source Hours	Gen Weight		Average net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	Average net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Price Differential	U90 Hours	U90 %
NYPP	NYISO 3 NYC	8784	6.711	2.657	1.852	3.064	46.81	762	P.JM	PSEG_5_MSA_Philadelphia_L	8784	2.143	2.766	-1.186	-2,037	50.63	-528	3.8	7605	87%
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359	10,066	38.79	2,167	VACAR	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,232	-3,594	42.59	-835	3.8		40%
PJM	PJM500_4_MSA_Philadelphia_G	8496	2,383	0	1,449	2,346	50.48		PJM	PECO_5_MSA_Philadelphia_L	6985	1,656	2,510	-424	-2,442	54.27	-161	3.8	1	0%
MISO	ITC_3_MSA_Detroit_G	8784	3,815	1,600	1,252	1,948	38.23	421		FE_5_MSA_Cleveland_L AP_7_MSA_Hagerstown-	6639	3,216	4,680	-553	-2,419	42.00	-154	3.8	8361	95%
P.JM	VAP 7 G	7413	4,179	303	1,507	3,629	45.32	506		Martinsburg L	8784	203	1,153	-662	-1,009	49.08	-285	3.8	5860	67%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62			TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	3.7		67%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762	NEPOOL	NEPOOL_6_WCMA	8707	4,285	3,417	-1,409	-3,954	50.54	-620	3.7	8390	96%
ONTARIO	IESO_6_G	8784	2,146	147	1,844	2,071	37.71			NYISO_6_NYF	1006	4,103	1,983	-230	-1,041	41.39	-10	3.7	6319	72%
ONTARIO ONTARIO	IESO_7_G IESO 15 G	8784 8396	2,953 1.964	253 3.375	2,502 1.094	2,825 2.054	37.71 37.72			NYISO_6_NYF NYISO 6 NYF	1006 1006	4,103 4,103	1,983 1,983	-230 -230	-1,041 -1.041	41.39 41.39	-10 -10	3.7 3.7	6319 6315	72% 72%
	AP 1 County Harrison G	8784	6,563	2,223	2,424	3,969	43.51			VAP 15 MSA VB-Norfolk L	8784	4,103	1,963	-494	-1,149	47.17	-205	3.7		86%
MISO	BREC_3_County_Webster_G	8784	1,355	476	902	1,135	33.08			LGEE_9_MSA_Louisville_G	8784	1,136	1,763	-959	-1,773	36.72	-309	3.6		85%
NEPOOL	NEPOOL_3_ME	3752	3,494	2,522	297	1,074	46.10			NEPOOL_10_RI	6243	2,062	2,203	-366	-1,145	49.72	-114	3.6		78%
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62			LGEE_5_MSA_Lexington_L	8784	595	2,345	-1,654	-2,693	43.24	-628	3.6		18%
NYPP	NYISO_3_NYC	8784	6,711	2,657	1,852	3,064	46.81	762	NEPOOL	NEPOOL_4_NEBOS	8631	3,262	5,904	-1,262	-3,970	50.39	-549	3.6	8764	100%
VACAR	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62	16	SOUTHERN	SOCO_10_MSA_Albany- Valdosta I.	7678	3,431	4,125	-720	-2,899	44.18	-244	3.6	498	6%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496	1,895	35.70			TVA_7_MSA_Memphis_L	8725	7,215	5,982	-1,376	-4,095	39.25	-471	3.5	5676	65%
	SOCO_26_MSA_Macon_G	8784	6,802	0	5,108	6,282	42.24			FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,853	-3,468	45.78	-745	3.5	3607	41%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,307	-2,681	44.75	-514	3.5	4042	46%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	662	SOUTHERN	SOCO_17_MSA_Mobile_G	7680	5,205	4,575	-584	-2,068	40.12	-180	3.5	5534	63%
SPP	CELE_10_MSA_Alexandria_G	8586	1,895	742	356	1,228	40.95	125	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	3.5	6488	74%
	PJM500_3_MSA_Pittsburgh_G	8758	1,705	0	1,368	1,700	43.76		PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-494	-1,149	47.17	-205	3.4		86%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496	1,895	35.70			TVA_3_MSA_Knoxville_L	8784	3,684	5,102	-1,211	-2,885	39.10	-416	3.4		64%
	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38			FPC_3_MSA_Orlando_L	8784	1,232	3,649	-1,853	-3,468	45.78	-745	3.4	3424	39%
MISO NYPP	AMRN_12_MSA_StLouis_L NYISO 8 NYH	6702 8784	5,059 2,021	6,066 973	757 1,581	1,937 1,945	31.17 53.25			AMRN_2_County_Macon_L NYISO 11 NYK	8784 8784	174 5.681	1,209 5,289	-716 -1,869	-1,132 -2,703	34.55 56.62	-217 -930	3.4		50% 100%
	NEPOOL 2 NH	8501	4,204	2,621	1,014	1,845	48.52			NYISO_TI_NTK	8420	3,156	2,195	-1,009	-1,477	51.85	-320	3.4	6881	78%
SPP	AEPW 5 MSA Tulsa G	7062	4,226	2.571	388	1,209	36.60			AEPW_9_MSA_MountPleasan	1800	8,168	3,832	-294	-1,361	39.92	-21	3.3	3516	40%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62			AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	3.3	5982	68%
	IPL_2_MSA_Jasper_G	8784	1,678	0	1,435	1,664	36.63			AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	3.3	4149	47%
	AECI_4_GEN_NewMadrid1_G	8784	2,315	248	1,168	1,641	36.21			EES_9_MSA_Russellville_G	6307	6,123	4,517	-450	-1,630	39.49	-112	3.3		51%
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359	10,066	38.79	2,167	MISO	FE_5_MSA_Cleveland_L	6639	3,216	4,680	-553	-2,419	42.00	-154	3.2	4962	56%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	3.2	6629	75%
	SEC_6_MSA_Palatka_G	8160	1,330	0	1,220	1,330	45.56			FPL_7_MSA_Miami_L	8784	570	3,923	-2,490	-4,080	48.68	-1,065	3.1	4733	54%
	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	38.01			AP_2_GEN_Albright3_L	8784	603	1,748	-1,114	-1,695	41.10	-402	3.1	4812	55%
P.IM	DOE 7 MCA Politimore Toursen	7066	2.548	1.043	549	1,095	51.17	100	PJM	PECO_5_MSA_Philadelphia_L	6985	1.656	2,510	-424	-2,442	54.27	-161	3.1	3818	43%
PJM	BGE_7_MSA_Baltimore-Towson_ PJM500_9_MSA_Pittsburgh_G	8784	1,700	1,043	1,473	1,700	44.08			VAP_15 MSA_Philadelphia_L	8784	435	1,297	-424 -494	-1,149	47.17	-161	3.1		43% 86%
	SEC_6_MSA_Palatka_G	8160	1,330	0	1,220	1,330	45.56			FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65	-817	3.1		54%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923	2,287	38.10	643	PJM	AP_2_GEN_Albright3_L	8784	603	1,748	-1,114	-1,695	41.10	-402	3.0	4809	55%
MISO	FE_9_MSA_Weirton_G	8628	1,860	112	1,220	1,808	38.10			AP_2_GEN_Albright3_L	8784	603	1,748	-1,114	-1,695	41.10	-402	3.0		55%
NEPOOL	NEPOOL_2_NH	8501	4,204	2,621	1,014	1,816	48.52	418	NEPOOL	NEPOOL_9_NWKST	8784	405	1,524	-692	-1,141	51.52	-313	3.0	8779	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76	771	VACAR	SCPSA 2 MSA Charleston L	8784	1,607	3,236	-1,307	-2,681	44.75	-514	3.0	2417	28%
	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62			AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	-553	3.0		59%
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,435	1,664	36.63	462		AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	-553	3.0	4341	49%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	-244	3.0	1758	20%
COLITUEDO	2000 20 M2A Bii	0040	0.505	1 000	4 0 4 0	4 04-	44.00	40.4	VACAD	CODEN O MEN OF	070	4 00=	0.000	4 00-	0.004	44	-514		0.457	0001
	SOCO_28_MSA_Birmingham_G NYISO 3 NYC	8616 8784	2,535 6,711	1,090 2,657	1,342 1,852	1,917 3,064	41.83 46.81		VACAR NEPOOL	SCPSA_2_MSA_Charleston_L NEPOOL 10 RI	8784 6243	1,607 2,062	3,236 2,203	-1,307 -366	-2,681 -1,145	44.75 49.72	-514 -114	2.9	2457 8764	28% 100%
DATE	141100_0_1410	0/04	0,717	2,007	1,002	3,004	40.01	/02		EES 7 MSA Beaumont-	0243	2,002	2,203	-306	-1,140	49.12	-114	2.9	0/04	100%
SPP	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60	100		PortArthur_G	6142	7,393	4,949	-435	-1,610	39.49	-105	2.9	6069	69%
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62			SOCO_5_GEN_GEPCHY_L	8784	2,098	3,403	-1,790	-2,847	42.52	-668	2.9	652	7%
SPP	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60	100	ENTERGY	EES_9_MSA_Russellville_G	6307	6,123	4,517	-450	-1,630	39.49	-112	2.9	5952	68%
SPP	AEPW 9 MSA MountPleasant (	6984	8.168	2 022	534	1.673	36.63	107	ENTERGY	EES_7_MSA_Beaumont-	6142	7 200	4.949	-435	-1.610	39.49	-105		0727	99%
5	TVA 4 MSA Clarksville G	6984 8616	8,168 2,544	3,832 150	2,099	1,673 2,473	36.63 36.62			PortArthur_G EES 9 MSA Russellville G	6142 6307	7,393 6,123	4,949 4,517	-435 -450	-1,610 -1,630	39.49	-105 -112	2.9 2.9	8737 5492	99% 63%
	AEPW 9 MSA MountPleasant (	6984	8,168	3,832	534	1,673	36.63			EES_9_MSA_Russellville_G	6307	6,123	4,517	-450	-1,630	39.49	-112	2.9	8747	100%
												5,120								. 5570
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62			SOCO_8_MSA_Atlanta_L	8784	0	1,925	-1,065	-1,811	42.46	-397	2.8	793	9%
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,423	1,584	45.85	573	FRCC	FPL_7_MSA_Miami_L	8784	570	3,923	-2,490	-4,080	48.68	-1,065	2.8	5038	57%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62	1,159	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	2.8	754	9%
T./ALIT::05	TVA 4 MOA Ob		47.00	0.000					00117755	0000 40 1404 411 11			0.0=-	,	6.746			-	0.50	
IVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62	1,159	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,410	-2,740	42.42	-526	2.8	259	3%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion	ndicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,423	1,584	45.85			FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65	-817	2.8	5048	57%
	NI_7_MSA_Rochelle_G WEC_1_MSA_Chicago_G	8784 8784	2,290 1,728	303	2,119 896	2,290 1.138	28.20 28.23			WEC_3_MSA_Milwaukee_G WEC_3_MSA_Milwaukee_G	7208 7208	1,429 1,429	2,423 2,423	-320 -320	-1,202 -1,202	30.99 30.99	-72 -72	2.8	5230 147	60% 2%
	TVA_1_MSA_Chatt-Hunts_G	8781	17,334	9,966	3,331	6,553	39.62			SOCO_21_MSA_Atlanta_G	8776	3,334	2,733	-1,117	-2,055	42.33	-415	2.7	145	2%
MISO	NIPS_8_MSA_Chicago_G	8760	2,892	1,694	920	1,665	31.13	251	PJM	NI_6_MSA_Chicago_G	463	9,759	7,577	-232	-1,050	33.83	-4	2.7	6	0%
VACAR	CPLE_1_MSA_Durham_G	7555	10,224	8,563	940	2,730	44.48	316	PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,297	-494	-1,149	47.17	-205	2.7	6298	72%
ENTERGY	EES 10 MSA Vicksburg G	8088	3,544	1,249	894	1,236	39.85	288	SOUTHERN	SOCO 5 GEN GEPCHY L	8784	2,098	3,403	-1,790	-2,847	42.52	-668	2.7	1944	22%
	AEPW_5_MSA_Tulsa_G	7062	4,226	2,571	388	1,209	36.60	100	ENTERGY	EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,233	-2,026	39.26	-425	2.7	5184	59%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2.123	5,257	41.76	774	ENTERGY	EES 5 MSA NewOrleans G	8784	9.735	9.294	-2,890	-5,151	44.43	-1,128	2.7	6871	78%
MISO	AMRN 12 MSA StLouis L	6702	5,059	6,066	757	1,937	31.17			NI_6_MSA_Chicago_G	463	9,759	7,577	-2,090	-1,050	33.83	-1,120 -4	2.7	5902	67%
										SOCO_6_MSA_Augusta-										
TVAUTHOR FRCC	TVA_1_MSA_Chatt-Hunts_G JEA 6 MSA Jacksonville G	8781 8784	17,334 1,665	9,966 358	3,331 909	6,553 1,349	39.62 46.04		SOUTHERN FRCC	Richmond_L FPL 7 MSA Miami L	8784 8784	<u>0</u> 570	1,187 3,923	-657 -2,490	-1,116 -4,080	42.27 48.68	-244 -1,065	2.6	349 4045	4% 46%
	AEPW_9_MSA_MountPleasant_0	6984	8,168	3,832	534	1,673	36.63			EES_1_MSA_Jackson_L	8784	3,218	3,066	-1,233	-2,026	39.26	-1,065	2.6	8745	100%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62		TVAUTHOR	TVA_7_MSA_Memphis_L	8725	7,215	5,982	-1,376	-4,095	39.25	-471	2.6	5089	58%
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	909	1,349	46.04	368	FRCC	FPL_3_MSA_Miami_L	8783	6,944	7,089	-1,913	-4,084	48.65	-817	2.6	4067	46%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3.544	1,249	894	1.236	39.85	288	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	0	1.925	-1.065	-1.811	42.46	-397	2.6	2040	23%
NYPP	NYISO_6_NYF	7778	4,103	1,983	618	1,759	49.25			NYISO_7_NYG	8420	3,156	2,195	-732	-1,477	51.85	-320	2.6	4735	54%
SPP	WERE 1 MSA Manhattan G	9720	2,988	409	1,343	2 277	24.02	264	SPP	KACD 7 MCA KanagaCity I	8784	0	1 201	-691	-1,351	33.63	-204	2.6	2472	260/
SPP	WERE_1_MSA_Mannattan_G	8739	2,988	409	1,343	2,277	31.03	364	SPP	KACP_7_MSA_KansasCity_L	8784	0	1,291	-691	-1,351	33.63	-204	2.6	3172	36%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	894	1,236	39.85			SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	2.6	2028	23%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,342	1,917	41.83	484	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	2.6	6837	78%
ENTERGY	EES 10 MSA Vicksburg G	8088	3.544	1.249	894	1.236	39.85	288	SOUTHERN	SOCO 16 MSA Atlanta L	8784	694	3.058	-1.410	-2.740	42.42	-526	2.6	1698	19%
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,952	2,769	37.86			TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	2.5	5565	63%
	SOCO_26_MSA_Macon_G TVA_4_MSA_Clarksville_G	8784 8616	6,802 2,544	0 150	5,108 2,099	6,282 2,473	42.24 36.62		VACAR	SCPSA_2_MSA_Charleston_L TVA_3_MSA_Knoxville_L	8784 8784	1,607 3,684	3,236 5,102	-1,307 -1,211	-2,681 -2,885	44.75 39.10	-514 -416	2.5 2.5	1459 5137	17% 58%
TVAOTTION	TVA_4_WOA_OlarkSVIIIC_O	0010	2,044	100	2,000	2,410	30.02	002	TVAOTITION	TVA_0_WOA_WOXVIIIC_E	0704	3,004	0,102	-1,211	-2,000	33.10	-410	2.0	3137	3070
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	894	1,236	39.85	288	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776	3,334	2,733	-1,117	-2,055	42.33	-415	2.5	1545	18%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	3,544	1,249	894	1,236	39.85	200	SOUTHERN	SOCO_6_MSA_Augusta- Richmond L	8784	0	1,187	-657	-1,116	42.27	-244	2.4	1491	17%
LIVILIGI	LL3_10_W3A_Vicksburg_G	0000	3,344	1,243	034	1,230	35.03	200	300 IIILKIN	SOCO_10_MSA_Albany-	0704	- 0	1,107	-037	-1,110	42.21	-244	2.4	1431	17 /0
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76	771	SOUTHERN		7678	3,431	4,125	-720	-2,899	44.18	-244	2.4	536	6%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	103	VACAR	SCEG_9_MSA_Charleston_G	8611	1,152	1,944	-401	-1,540	43.63	-151	2.4	3439	39%
COOTTIERIN	OCCO_02_WOA_1 ascagoula_C	0110	0,014	2,074	370	1,000	71.22	133	VAOAIT	OCEO_S_WOA_Onancston_C	0011	1,102	1,544	-101	-1,040	40.00	-101	2.7	5455	3370
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38	1,508	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,307	-2,681	44.75	-514	2.4	2615	30%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,342	1,917	41.83	191	SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	7678	3,431	4,125	-720	-2,899	44.18	-244	2.3	544	6%
SOUTHLINE	30CO_28_W3A_Birriingnam_G	0010	2,333	1,050	1,342	1,517	41.03	404	SOUTHLINE		7070	3,431	4,123	-720	-2,055	44.10	-244	2.3	344	0 /6
ENTERGY	EES_4_GEN_Ouachita_G	5357	6,345	2,417	1,375	3,621	42.08		ENTERGY	EES_5_MSA_NewOrleans_G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	2.3	6332	72%
	AEP_8_GEN_Amos01_G NYISO 8 NYH	8784 8784	19,694 2,021	6,544 973	6,359 1,581	10,066 1,945	38.79 53.25	2,167	NYPP	AP_2_GEN_Albright3_L NYISO 10 NYJ	8784 8784	603 10,283	1,748 11,493	-1,114 -3,758	-1,695 -5,317	41.10 55.54	-402 -1,833	2.3	6110 8783	70% 100%
	NYISO_6_NYF	7778	4,103	1,983	618	1,759	49.25			NEPOOL_9_NWKST	8784	405	1,524	-692	-1,141	51.52	-313	2.3	8767	100%
		0704							ENTER OV	FF0 # 1101 11 01 0	0704								0050	700/
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,108	6,282	42.24	1,895	ENTERGY	EES_5_MSA_NewOrleans_G AEP 9 MSA Canton-	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	2.2	6959	79%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	2,544	150	2,099	2,473	36.62	662	PJM	Massillon_L	8784	733	2,120	-1,414	-2,058	38.80	-482	2.2	5321	61%
		0704	4.070						5.11	AEP_9_MSA_Canton-	0704	=00	0.400		0.050		400			000/
MISO	IPL_2_MSA_Jasper_G	8784	1,678	0	1,435	1,664	36.63	462	PJM	Massillon_L SOCO_10_MSA_Albany-	8784	733	2,120	-1,414	-2,058	38.80	-482	2.2	2600	30%
ENTERGY	EES_4_GEN_Ouachita_G	5357	6,345	2,417	1,375	3,621	42.08	310	SOUTHERN	Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	-244	2.1	1893	22%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	VACAR	DUK_4_MSA_Greenville_L	6956	3,546	4,489	-618	-2,091	43.29	-186	2.1	3343	38%
SOUTHERN	SOCO 31 MSA Atlanta G	8772	11,765	1,583	4,057	8,815	42.38	1 508	ENTERGY	EES 5 MSA NewOrleans G	8784	9,735	9,294	-2,890	-5,151	44.43	-1,128	2.0	6886	78%
SOUTHERN		0112	11,703	1,000	4,037	0,013	42.30	1,500	LINILINGI	METC_4_MSA_Holland-	0704	3,733	3,234	-2,090	-5,151	44.45	-1,120	2.0	0000	7070
MISO	WEC_1_MSA_Chicago_G	8784	1,728	303	896	1,138	28.23		MISO	GrandHaven_G	2565	7,365	2,900	-1,026	-2,869	30.27	-80	2.0	5769	66%
PJM NEPOOL	VAP_1_MSA_Richmond_G NEPOOL 2 NH	8784 8501	10,524 4,204	3,579 2,621	3,288 1.014	6,493 1.816	47.58 48.52	1,374		AP_8_MSA_DC-VA-MD_L NEPOOL 6 WCMA	8784 8707	4,285	1,097 3,417	-798 -1.409	-1,144 -3.954	49.61 50.54	-348 -620	2.0	4191 6955	48% 79%
	ALTE_2_MSA_Madison_G	8616	1,665	441	590	1,010	29.01		MISO	WEC_3_MSA_Milwaukee_G	7208	1,429	2,423	-1,409	-1,202	30.99	-72	2.0	2479	28%
VACAR	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62	16	VACAR	DUK_8_MSA_Charlotte_L	8784	1,407	4,886	-2,232	-3,594	42.59	-835	2.0	0	0%
NYPP	NYISO_6_NYF	7778	4,103	1,983	618	1,759	49.25	237	PJM	PSEG_8_MSA_NewYork_G SOCO_10_MSA_Albany-	8779	3,860	3,654	-1,066	-2,403	51.21	-479	2.0	7735	88%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,108	6,282	42.24	1,895	SOUTHERN		7678	3,431	4,125	-720	-2,899	44.18	-244	1.9	675	8%
VACAR ONTARIO	DUK_4_MSA_Greenville_L IESO 6 G	1828 8784	3,546 2,146	4,489 147	215 1.844	1,012 2.071	40.62 37.71			SOCO_5_GEN_GEPCHY_L NYISO 2 NYB	8784 8784	2,098 650	3,403 1,759	-1,790 -706	-2,847 -1.571	42.52 39.58	-668 -245	1.9	35 8313	0% 95%
ONTARIO	IESO_6_G IESO_7_G	8784 8784	2,146	253	2,502	2,825	37.71			NYISO_2_NYB NYISO_2_NYB	8784 8784	650	1,759	-706	-1,571	39.58	-245 -245	1.9	8429	95%
	NEPOOL_2_NH	8501	4,204	2,621	1,014	1,816	48.52			NEPOOL_4_NEBOS	8631	3,262	5,904	-1,262	-3,970	50.39	-549	1.9	6823	78%
COLITHERN	SOCO 15 MSA Disminahan: O	9605	10 464	0.247	2 422	F 257	44 70	774	VACAR	SCEC O MSA Chadastar C	0644	4 450	1.044	404	1 540	42.60	454	4.0	25.40	2007
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	12,464	9,217	2,123	5,257	41.76	//1	VACAR	SCEG_9_MSA_Charleston_G	8611	1,152	1,944	-401	-1,540	43.63	-151	1.9	2548	29%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion	Indicators	
Codico Fide III	iomaton				Average				OHIIK TIGE HITE	maton				Average				Congodion	Indicatoro	
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net	Max net	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	injection (MW)	injection (MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
	IESO_15_G	8396	1,964	3,375	1,094	2,054	37.72			NYISO_2_NYB	8784	650		-706	-1,571	39.58	-245	1.9		94%
	NYISO_6_NYF NIPS_8_MSA_Chicago_G	7778 8760	4,103 2,892	1,983 1,694	618 920	1,759 1,665	49.25 31.13	237	PJM PJM	PSEG_3_MSA_NewYork_L NI_3_MSA_Chicago_L	8784 8784	1,843 26	2,275 1,205	-879 -634	-1,841 -1,254	51.11 32.98	-395 -184	1.9	7732	88% 0%
	VAP 7 G	7413	4,179	303	1,507	3,629	45.32	506	PJM	VAP_15_MSA_VB-Norfolk_L	8784	435	1,203	-494	-1,149	47.17	-205	1.8	5970	68%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923	2,287	38.10	643	PJM	AEP_1_MSA_Lynchburg_G	8784	843	2,162	-1,529	-2,299	39.95	-537	1.8	6538	74%
	FE_9_MSA_Weirton_G DUK 4 MSA Greenville L	8628 1828	1,860 3,546	112 4.489	1,220 215		38.10 40.62	401		AEP_1_MSA_Lynchburg_G SOCO 8 MSA Atlanta L	8784 8784	843		-1,529 -1.065	-2,299 -1.811	39.95 42.46	-537 -397	1.8 1.8	6422 252	73% 3%
	NIPS 8 MSA Chicago G	8760	2,892	1,694	920		31.13	251		NI 13 MSA Chicago L	8784	2,396	.,	-5,262	-9,151	32.96	-1,524	1.8	206	2%
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	0	1,220	1,330	45.56	453	FRCC	FPL_2_MSA_FortMyers_G	8464	5,929	4,563	-1,018	-2,545	47.39	-408	1.8	3796	43%
	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215		40.62			SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	1.8	182	2%
	NEPOOL_7_CT AMRN 12 MSA StLouis L	7667 6702	4,447 5,059	3,920 6,066	690 757	1,740 1,937	50.04 31.17			NYISO_7_NYG NI_3_MSA_Chicago_L	8420 8784	3,156 26		-732 -634	-1,477 -1,254	51.85 32.98	-320 -184	1.8		66% 66%
	**************************************	0.02	0,000	0,000		1,001	01.11	100		- II_O_INIO/I_OIII0ago_E	0.01		1,200	001	1,201	02.00		1.0	0.0.	- 0070
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	2,535	1,090	1,342	1,917	41.83			SCEG_9_MSA_Charleston_G	8611	1,152		-401	-1,540	43.63	-151	1.8	2553	29%
PJM	NI_2_MSA_Chicago_G	8784	5,342	1,283	3,498	4,181	32.75	1,006	MISO	AMRN_2_County_Macon_L	8784	174	1,209	-716	-1,132	34.55	-217	1.8	4908	56%
VACAR	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62	16	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,410	-2,740	42.42	-526	1.8	253	3%
77107111	BOILT I MONGO CONTINUE	1020	0,010	1,100	2.0	1,012	10.02			SOCO_10_MSA_Albany-	0.01	001	0,000	1,110	2,7 10	.22	020	1.0	200	- 070
	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38		SOUTHERN	Valdosta_L	7678	3,431	4,125	-720	-2,899	44.18	-244	1.8	480	5%
MISO MISO	AMRN_12_MSA_StLouis_L CIN 3 MSA TerreHaute G	6702 6968	5,059 3,230	6,066 1,015	757 796	1,937 2,234	31.17 38.21		PJM PJM	NI_13_MSA_Chicago_L AEP_1_MSA_Lynchburg_G	8784 8784	2,396 843		-5,262 -1,529	-9,151 -2,299	32.96 39.95	-1,524 -537	1.8 1.7		67% 38%
	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,288		47.58	1,374		VAP_33_MSA_DC_L	8784	910		-1,704	-2,233	49.31	-738	1.7		53%
VACAR FRCC	DUK_4_MSA_Greenville_L FPL_8_MSA_PortStLucie_G	1828 8751	3,546 10,364	4,489 4,623	215 2,026	1,012 5,279	40.62 46.99			SOCO_21_MSA_Atlanta_G FPL 7 MSA Miami L	8776 8784	3,334 570	2,733	-1,117 -2,490	-2,055 -4,080	42.33 48.68	-415 -1,065	1.7	103 3103	1% 35%
	DUK_9_MSA_Charlotte_G	8783	14,681	9,966	3,042	5,279	42.51			SOCO_10_MSA_Albany-Valdos	7678	3,431	4,125	-2,490	-2,899	44.18	-1,065	1.7	538	6%
FRCC	FPL_8_MSA_PortStLucie_G	8751	10,364	4,623	2,026	5,279	46.99	833	FRCC	FPL_3_MSA_Miami_L	8783	6,944		-1,913	-4,084	48.65	-817	1.7	2469	28%
	DUK_4_MSA_Greenville_L	1828	3,546	4,489	215	1,012	40.62			SOCO_6_MSA_Augusta-Richm	8784	0	1,101	-657	-1,116	42.27	-244	1.6	349	4%
	EKPC_8_MSA_Maysville_G EES_2_MSA_Batesville_G	8784 8784	1,396 3,525	272 1,697	927 1,952	1,366 2,769	38.73 37.86	315 640	ENTERCY	TVA_5_MSA_Nashville_L EES_9_MSA_Russellville_G	8567 6307	9,154 6,123	8,858 4,517	-1,556 -450	-4,023 -1,630	40.36 39.49	-538 -112	1.6 1.6		61% 24%
PJM	VAP 1 MSA Richmond G	8784	10,524	3,579	3,288		47.58	1,374	PJM	VAP 27 MSA DC L	8784	0,123	1,048	-641	-1,030	49.20	-277	1.6		39%
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359	10,066	38.79	2,167	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	9,154	8,858	-1,556	-4,023	40.36	-538	1.6	5813	66%
	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,423	1,584	45.85			FPL_2_MSA_FortMyers_G	8464	5,929		-1,018	-2,545	47.39	-408	1.5	4827	55%
	EES_7_MSA_Beaumont-PortArth SOCO_15_MSA_Birmingham_G	2642 8695	7,393 12,464	4,949 9,217	345 2,123	1,123 5,257	42.89 41.76			EES_5_MSA_NewOrleans_G DUK_4_MSA_Greenville_L	8784 6956	9,735 3,546		-2,890 -618	-5,151 -2,091	44.43 43.29	-1,128 -186	1.5 1.5	6328 2501	72% 28%
SOUTHERN	30CO_13_W3A_Biiiiiighaiii_G	0033	12,404	5,217	2,123	3,231	41.70	771	VACAIN	AP_7_MSA_Hagerstown-	0330	3,340	4,403	-010	-2,031	45.25	-100	1.0	2301	2070
PJM	VAP_1_MSA_Richmond_G	8784	10,524	3,579	3,288	6,493	47.58	1,374	PJM	Martinsburg_L	8784	203		-662	-1,009	49.08	-285	1.5	4933	56%
MISO NEPOOL	LGEE_3_GEN_Gehnt2_G NEPOOL 5 SEMA	8784 8784	2,000 6,454	225 3,978	1,496 1,957	1,895 3,704	35.70 50.35			CIN_1_MSA_Indianapolis_L NYISO 7 NYG	8784 8420	816 3,156		-2,176 -732	-3,301 -1,477	37.20 51.85	-711 -320	1.5 1.5	4943 5835	56% 66%
	FE_6_MSA_Pittsburgh_G	8784 8784	2,371	213	1,957	2,287	38.10			AEP_2_STA_TN-WV_L	8420 8784	1,284		-1,591	-1,477	39.59	-553	1.5		60%
MISO	FE_9_MSA_Weirton_G	8628	1,860	112	1,220	1,808	38.10	401	PJM	AEP_2_STA_TN-WV_L	8784	1,284	2,977	-1,591	-2,640	39.59	-553	1.5	5114	58%
	NEPOOL_7_CT	7667	4,447	3,920	690	1,740	50.04			NEPOOL_9_NWKST	8784	405		-692	-1,141	51.52	-313	1.5		100%
	FPC_10_MSA_Lakeland_G SOCO 28 MSA Birmingham G	8093 8616	3,561 2,535	747 1,090	1,116 1,342	2,047 1,917	47.21 41.83			FPL_7_MSA_Miami_L DUK 4 MSA Greenville L	8784 6956	570 3,546		-2,490 -618	-4,080 -2,091	48.68 43.29	-1,065 -186	1.5 1.5	4378 2469	50% 28%
	WERE_1_MSA_Manhattan_G	8739	2,988	409	1,343		31.03	364		AEPW_1_MSA_Tulsa_G	7156	3,295		-556	-1,182	32.47	-129	1.4		99%
FRCC	FPC_10_MSA_Lakeland_G	8093	3,561	747	1,116		47.21			FPL_3_MSA_Miami_L	8783	6,944		-1,913	-4,084	48.65	-817	1.4		50%
ENTERGY	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,952	2,769	37.86	649	TVAUTHOR	TVA_7_MSA_Memphis_L	8725	7,215	5,982	-1,376	-4,095	39.25	-471	1.4	3147	36%
SOUTHERN	SOCO 26 MSA Macon G	8784	6,802	0	5.108	6.282	42.24	1.895	VACAR	SCEG 9 MSA Charleston G	8611	1.152	1,944	-401	-1.540	43.63	-151	1.4	2536	29%
	NI_6_MSA_Chicago_G	8321	9,759	7,577	1,110		33.17			AMRN_2_County_Macon_L	8784	174		-716	-1,132	34.55	-217	1.4		55%
NYPP	NYISO 6 NYF		4 400	4 000	618		10.05			D050 5 MOA DUT	0704		0.700	4 400		=0.00	=00	1.4	7005	91%
	NYISO_6_NYF CIN_3_MSA_TerreHaute_G	7778 6968	4,103 3,230	1,983 1,015	796	1,759 2,234	49.25 38.21	237 212		PSEG_5_MSA_Philadelphia_L AEP_2_STA_TN-WV_L	8784 8784	2,143 1,284		-1,186 -1,591	-2,037 -2,640	50.63 39.59	-528 -553	1.4	7985 3626	91% 41%
	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578		41.22	193	VACAR	DUK_8_MSA_Charlotte_L	8784	1,407		-2,232	-3,594	42.59	-835	1.4		39%
FRCC	SEC_6_MSA_Palatka_G	8160	1,330	0	1,220		45.56			FPC_4_MSA_Tampa_L	8784	2,239		-1,477	-2,349	46.91	-609	1.4		40%
FRCC	JEA_6_MSA_Jacksonville_G	8784	1,665	358	909	1,349	46.04	368	FRCC	FPL_2_MSA_FortMyers_G	8464	5,929	4,563	-1,018	-2,545	47.39	-408	1.4	3781	43%
VACAR	SCPSA_10_MSA_Charleston_G	8616	1,680	0	1,468	1,680	43.42	549	VACAR	SCPSA_2_MSA_Charleston_L	8784	1,607	3,236	-1,307	-2,681	44.75	-514	1.3	1545	18%
	SOCO_32_MSA_Pascagoula_G NYISO 6 NYF	8110 7778	3,574	2,674 1,983	578 618	1,690 1,759	41.22 49.25			SOCO_5_GEN_GEPCHY_L	8784 8707	2,098	3,403	-1,790 -1,409	-2,847	42.52 50.54	-668	1.3 1.3	1914 7472	22% 85%
PJM	NYISO_6_NYF DPL 8 GEN Killen G	7778 8759	4,103 2,964	1,983	2,042		49.25 38.65	237 691		NEPOOL_6_WCMA AEP 1 MSA Lynchburg G	8707 8784	4,285 843		-1,409 -1,529	-3,954 -2,299	39.95	-620 -537	1.3	3219	85% 37%
ENTERGY	EES_7_MSA_Beaumont-PortArth	2642	7,393	4,949	345	1,123	42.89	39	SOUTHERN	SOCO_10_MSA_Albany-Valdos	7678	3,431	4,125	-720	-2,899	44.18	-244	1.3	3667	42%
	FPC_2_MSA_HomosassaSprings	8784	1,584	0	1,423		45.85			TECO_7_MSA_Tampa_L	8784	0		-951	-2,004	47.11	-394	1.3	3198	36%
NYPP	NYISO_1_NYA	8323	4,946	2,500	1,595	2,319	40.13	533	NYPP	NYISO_6_NYF	1006	4,103	1,983	-230	-1,041	41.39	-10	1.3	6167	70%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	11,765	1,583	4,057	8,815	42.38	1,508	VACAR	SCEG_9_MSA_Charleston_G	8611	1,152	1,944	-401	-1,540	43.63	-151	1.3	2679	30%
	EES_2_MSA_Batesville_G	8784	3,525	1,697	1,952	2,769	37.86			TVA_3_MSA_Knoxville_L	8784	3,684		-1,211	-2,885	39.10	-416	1.2		42%
SOUTHERN	SOCO 32 MSA Pascagoula G	8110	3,574	2,674	578	1,690	41.22	400	CULTHEBR	SOCO 8 MSA Atlanta L	8784	^	1,925	-1,065	-1,811	42.46	-397	1.2	2002	23%
SOUTHERN	SOCO_SZ_IVISA_Pascagoula_G	8110	3,574	2,074	5/8	1,090	41.22	193	SOUTHERN	JUUU_o_IVIOA_ATIANTA_L	8784	0	1,925	-1,065	-1,811	42.46	-397	1.2	2002	23%
	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22			SOCO_33_MSA_Atlanta_L	8784	3	3,305	-1,828	-3,110	42.45	-682	1.2	1961	22%
	NI_15_MSA_Davenport_G	8670	2,479	0	1,728		27.04			WEC_7_MSA_Milwaukee_G	7702	3,850	3,052	-503	-1,514	28.25	-109	1.2		62%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	1,644	25	1,310	1,633	38.01	429	MISO	FE_4_MSA_Akron_L	8784	531	2,277	-1,274	-1,904	39.21	-439	1.2	1333	15%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578	1,690	41.22	193	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	694	3,058	-1,410	-2,740	42.42	-526	1.2	1643	19%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2008R2

Source Hub	nformation								Sink Hub Info	rmation								Congestion I	ndicators	
					Average			_						Average			_			
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area		Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)		Market Area		Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)		Differential		U90 %
NEPOOL	NEPOOL_2_NH	8501	4,204		1,014					NEPOOL_10_RI	6243	2,062	2,203	-366	-1,145	49.72		1.2	6823	78%
MISO	ITC_7_MSA_Monroe_G	8712	1,500		1,307					FE_4_MSA_Akron_L	8784	531	2,277	-1,274	-1,904	39.21		1.2	4706	54%
NEPOOL	NEPOOL_5_SEMA	8784	6,454	3,978	1,957					NEPOOL_9_NWKST	8784	405	1,524	-692	-1,141	51.52		1.2	8754	100%
PJM	AEP_8_GEN_Amos01_G	8784	19,694	6,544	6,359			2,167		AEP_1_MSA_Lynchburg_G	8784	843	2,162		-2,299	39.95		1.2	3212	37%
NYPP	NYISO_6_NYF	7778	4,103	1,983	618					NEPOOL_4_NEBOS	8631	3,262	5,904	-1,262	-3,970	50.39		1.1	7494	85%
PJM	NI_20_MSA_Chicago_G	7234	1,632	83	896		33.43			AMRN_2_County_Macon_L	8784	174	1,209	-716	-1,132	34.55		1.1	4804	55%
MISO	FE_6_MSA_Pittsburgh_G	8784	2,371	213	1,923		38.10			FE_4_MSA_Akron_L	8784	531	2,277	-1,274	-1,904	39.21	-439	1.1	1289	15%
MISO	FE_9_MSA_Weirton_G	8628	1,860	112	1,220	1,808	38.10	401	MISO	FE_4_MSA_Akron_L	8784	531	2,277	-1,274	-1,904	39.21	-439	1.1	3864	44%
	SOCO_32_MSA_Pascagoula_G	8110	3,574		578					SOCO_21_MSA_Atlanta_G	8776	3,334	2,733	-1,117	-2,055	42.33		1.1	1500	17%
PJM	NI_2_MSA_Chicago_G	8784	5,342		3,498					NI_6_MSA_Chicago_G	463	9,759	7,577	-232	-1,050	33.83		1.1	0	0%
NYPP	NYISO_8_NYH	8784	2,021	973	1,581					NYISO_9_NYI	8467	2	1,476		-1,993	54.32		1.1	6780	77%
FRCC	FPC_2_MSA_HomosassaSprings	8784	1,584		1,423					FPC_4_MSA_Tampa_L	8784	2,239	2,873	-1,477	-2,349	46.91		1.1	2416	28%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	6,802	0	5,108	6,282	42.24	1,895		DUK_4_MSA_Greenville_L	6956	3,546	4,489	-618	-2,091	43.29	-186	1.0	1291	15%
										SOCO_6_MSA_Augusta-										
	SOCO_32_MSA_Pascagoula_G	8110	3,574	2,674	578				SOUTHERN		8784	0	1,187	-657	-1,116	42.27		1.0	1464	17%
MISO	LGEE_3_GEN_Gehnt2_G	8784	2,000	225	1,496	1,895	35.70	469	MISO	LGEE_9_MSA_Louisville_G	8784	1,136	1,763	-959	-1,773	36.72	-309	1.0	4975	57%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub I	nformation								Sink Hub Inf	ormation								Congestion	Indicators	
					Average		A	D						Average			D			
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,560	4,074	36.67	1,143	PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,606	-2,415	40.29	-567	3.6	4427	50%
PJM	NI_6_MSA_Chicago_G	7665	9,759	7,577	946	3,023	37.14		PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,606	-2,415	40.29	-567	3.2	4450	51%
PJM PJM	NI_7_MSA_Rochelle_G NI 15 MSA Davenport G	8760 8712	2,290 2,479	0	2,119	2,290 2,314	32.91 30.23		PJM PJM	AEP_1_MSA_Lynchburg_G	8760 8760	843 843	2,162	-1,606 -1.606	-2,415 -2,415	40.29 40.29	-567 -567	7.4 10.1	5550 5076	63%
PJM	NI_15_MSA_Davenport_G NI_20_MSA_Chicago_G	7874	1,632	83	1,684 888	1,578	36.53		PJM PJM	AEP_1_MSA_Lynchburg_G AEP_1_MSA_Lynchburg_G	8760	843	2,162 2,162	-1,606	-2,415 -2,415	40.29	-567	3.8	4319	58% 49%
MISO	NIPS 8 MSA Chicago G	8658	2,892	1,694	844	1,541	36.43		PJM	AEP 1 MSA Lynchburg G	8760	843	2,162	-1,606	-2,415	40.29	-567	3.9	4169	47%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	1,034	1,414	1,664	37.13		PJM	AEP 1 MSA Lynchburg G	8760	843	2,162	-1,606	-2,415	40.29	-567	3.2	6959	79%
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41	119		AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,606	-2,415	40.29	-567	9.9	7273	83%
PJM	NI_20_MSA_Chicago_G	7874	1,632	83	888	1,578	36.53	256	PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	3.8	1264	14%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,560	4,074	36.67	1,143		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	3.7	1358	15%
PJM PJM	NI_6_MSA_Chicago_G	7665 8760	9,759 2,290	7,577	946	3,023 2,290	37.14 32.91		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977 2,977	-1,691	-2,729 -2,729	40.37 40.37	-598 -598	3.2 7.5	1370	16%
PJM	NI_7_MSA_Rochelle_G NI 15 MSA Davenport G	8760	2,290	0	2,119 1,684	2,290	30.23	444	PJM	AEP_2_STA_TN-WV_L AEP 2 STA TN-WV L	8760 8760	1,284 1,284	2,977	-1,691 -1,691	-2,729	40.37	-598 -598	7.5 10.1	3718 3128	42% 36%
MISO	NIPS 8 MSA Chicago G	8658	2,892	1,694	844	1,541	36.43		PJM	AEP 2 STA TN-WV L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	3.9	1054	12%
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	36.63		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	3.7	5035	57%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,414	1,664	37.13		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	3.2	6276	71%
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41	119	PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,691	-2,729	40.37	-598	10.0	6397	73%
MICO	NIDO O MOA Obieses C	0050	2 000	1.004	044	4 5 4 4	26.42	200	DIM	AEP_9_MSA_Canton-	0700	700	2.400	4 550	2.250	40.70	F. 4		4000	4004
MISO	NIPS_8_MSA_Chicago_G	8658	2,892	1,694	844	1,541	36.43	266	PJM	Massillon_L AEP 9 MSA Canton-	8760	733	2,120	-1,552	-2,252	40.79	-554	4.4	1096	12%
PJM	NI 20 MSA Chicago G	7874	1,632	83	888	1,578	36.53	256	PJM	Massillon L	8760	733	2,120	-1,552	-2,252	40.79	-554	4.3	1689	19%
1 0141	NI_20_INIC/I_CHICUGO_C	7074	1,002	- 00	000	1,070	00.00	200	1 OIVI	AEP_9_MSA_Canton-	0700	700	2,120	1,002	2,202	40.73	00-1	4.0	1003	1370
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,684	2,314	30.23	444	PJM	Massillon_L	8760	733	2,120	-1,552	-2,252	40.79	-554	10.6	3668	42%
										AEP_9_MSA_Canton-										
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	32.91	611	PJM	Massillon_L	8760	733	2,120	-1,552	-2,252	40.79	-554	7.9	4027	46%
PJM	NII O MOA Obieses O	7665	9,759	7,577	946	3,023	37.14	200	PJM	AEP_9_MSA_Canton- Massillon L	8760	733	2,120	-1,552	-2,252	40.79	-554	3.6	1696	400/
PJIVI	NI_6_MSA_Chicago_G	7000	9,759	7,577	946	3,023	37.14	209	PJIVI	AEP 9 MSA Canton-	6760	733	2,120	-1,552	-2,252	40.79	-554	3.0	1696	19%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,560	4,074	36.67	1,143	PJM	Massillon L	8760	733	2,120	-1,552	-2.252	40.79	-554	4.1	1689	19%
										AEP_9_MSA_Canton-										
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41	119	PJM	Massillon_L	8760	733	2,120	-1,552	-2,252	40.79	-554	10.4	6611	75%
14100	IDL O MOA Jasaan O	0700	4.070			4 00 4	07.40	400	D.II.4	AEP_9_MSA_Canton-	0700	700	0.400	4.550	0.050	40.70	55.4	0.7	0.400	700/
MISO PJM	IPL_2_MSA_Jasper_G NI 6 MSA Chicago G	8760 7665	1,678 9,759	7,577	1,414 946	1,664 3,023	37.13 37.14		PJM MISO	Massillon_L AMRN 12 MSA StLouis L	8760 2483	733 5,059	2,120 6.066	-1,552 -436	-2,252 -1.841	40.79 42.11	-554 -46	3.7 5.0	6429 1447	73% 16%
MISO	CIN 8 MSA Evansville G	8760	3,657	260	2,516	3,391	37.14		MISO	AMRN 12 MSA StLouis L	2483	5,059	6.066	-436	-1,841	42.11	-46	4.9	6246	71%
MISO	IP 7 GEN Baldwin G	8760	1,900	444	1,150	1,478	32.77		MISO	AMRN 12 MSA StLouis L	2483	5,059	6,066	-436	-1,841	42.11	-46	9.3	1	0%
MISO	IP_8_GEN_Clinton_G	8002	2,302	1,195	927	1,212	35.59		MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	6.5	447	5%
MAPP	MEC_3_MSA_DesMoines_G	8427	3,307	1,933	601	1,391	22.45		MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	19.7	2611	30%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,560	4,074	36.67	1,143	MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	5.4	1432	16%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	1.2	1194	14%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,684	2,314	30.23		MISO	AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	11.9	2907	33%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159		AMRN_12_MSA_StLouis_L	2483	5,059	6,066	-436	-1,841	42.11	-46	1.6	110	1%
PJM PJM	NI_20_MSA_Chicago_G NI 7 MSA Rochelle G	7874 8760	1,632 2,290	83	888 2.119	1,578 2,290	36.53 32.91		MISO MISO	AMRN_12_MSA_StLouis_L AMRN 12 MSA StLouis L	2483 2483	5,059 5,059	6,066 6,066	-436 -436	-1,841 -1.841	42.11 42.11	-46 -46	5.6 9.2	1085 3849	12% 44%
ENTERGY	AECI 4 GEN NewMadrid1 G	8760	2,290	248	1,080	1,590	37.65		MISO	AMRN 12 MSA StLouis L	2483	5,059	6,066	-436 -436	-1,841	42.11	-46 -46	4.5	2590	29%
MISO	AMRN 12 MSA StLouis L	6277	5.059	6,066	626	1,857	30.41		MISO	AMRN 2 County Macon L	8760	174	1,209	-720	-1.156	36.57	-231	6.2	4271	49%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	32.91	611	MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	36.57	-231	3.7	5041	57%
MAPP	MEC_3_MSA_DesMoines_G	8427	3,307	1,933	601	1,391	22.45		MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	36.57	-231	14.1	4735	54%
MISO	IP_7_GEN_Baldwin_G	8760	1,900	444		1,478	32.77		MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	36.57	-231	3.8	4635	53%
PJM MISO	NI_15_MSA_Davenport_G FE 9 MSA Weirton G	8712 8760	2,479 1,860	112	1,684 1,388	2,314 1,802	30.23 40.46		MISO PJM	AMRN_2_County_Macon_L AP 2 GEN Albright3 L	8760 8760	174 603	1,209 1,748	-720 -1.115	-1,156 -1,684	36.57 42.35	-231 -414	6.3 1.9	4521 4667	51% 53%
PJM	DLCO 7 MSA Pittsburgh G	8232	1,860	25	1,388	1,802	40.46		PJM PJM	AP_2_GEN_Albright3_L  AP 2 GEN Albright3 L	8760	603	1,748	-1,115 -1,115	-1,684	42.35 42.35	-414 -414	2.2	4653	53%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159		AP_2_GEN_Albright3_L	8760	603	1,748	-1,115	-1,684	42.35	-414	1.8	6100	69%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34	681	PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,115	-1,684	42.35	-414	2.0	4518	51%
										AP_7_MSA_Hagerstown-										
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0.5==	1,492	1,700	44.80		PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	51.50	-309	6.7	7650	87%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,443	6,047	50.33	1,518	PJM	AP_7_MSA_Hagerstown-Martil AP 7 MSA Hagerstown-	8760	203	1,153	-686	-1,101	51.50	-309	1.2	4641	53%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1.705	0	1,440	1.700	44.47	561	PJM	Martinsburg_L	8760	203	1,153	-686	-1.101	51.50	-309	7.0	7651	87%
. 5141	. soso_o_wort_r maskingn_o	5,00	1,700		1,740	1,700	77.71	501	. 5.41	AP_7_MSA_Hagerstown-	5,00	200	1,100	500	1,101	31.30	503	7.0	7001	01 /0
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,388	1,802	40.46	492	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	51.50	-309	11.0	8187	93%
										AP_7_MSA_Hagerstown-										
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34	681	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	51.50	-309	11.2	8182	93%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,079	10,227	40.55	2,159	DIM	AP_7_MSA_Hagerstown- Martinsburg_L	8760	203	1,153	-686	-1,101	51.50	-309	11.0	8299	94%
i Jivi	AEF_0_GEN_AMOSUT_G	0700	19,094	0,544	0,079	10,227	40.05	2,159	ı JIVI	wardiisbuig_L	0700	203	1,103	-066	-1,107	ა 1.50	-309	11.0	8299	94%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion	Indicators	
					Average									Average			_			
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
					, ,	, ,	,	, ,		AP_7_MSA_Hagerstown-						,	,			
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,676	3,904	44.26	1,038	PJM	Martinsburg_L AP_7_MSA_Hagerstown-	8760	203	1,153	-686	-1,101	51.50	-309	7.2	7598	86%
PJM	VAP_7_G	6808	4,179	303	1,699	3,608	48.73	564	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	51.50	-309	2.8	5267	60%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	40.16	450	PJM	AP_7_MSA_Hagerstown- Martinsburg L	8760	203	1,153	-686	-1,101	51.50	-309	11.3	8186	93%
MISO	FE 9 MSA Weirton G	8760	1,860	112	1,388	1,802	40.16		PJM	AP 8 MSA DC-VA-MD L	8760	203	1,133	-728	-1,101	51.92	-331	11.5	8233	94%
PJM	VAP 7 G	6808	4,179	303	1,699	3,608	48.73		PJM	AP 8 MSA DC-VA-MD L	8760	0	1.097	-728	-1.048	51.92	-331	3.2	5528	63%
PJM	VAP 1 MSA Richmond G	8760	10,524	3,579	3,443	6,047	50.33	1.518		AP 8 MSA DC-VA-MD L	8760	0	1,097	-728	-1.048	51.92	-331	1.6	3942	45%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	44.80	579	PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	7.1	7744	88%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,676	3,904	44.26	1,038	PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	7.7	7687	88%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47	561	PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	7.4	7730	88%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159		AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	11.4	8079	92%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	11.6	8220	94%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	40.16	452	PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	51.92	-331	11.8	8230	94%
PJM	PJM500 9 MSA Pittsburgh G	8664	1,700	0	1,492	1,700	44.80	570	PJM	BGE_10_MSA_Baltimore- Towson L	8760	845	1,565	-478	-1,030	52.69	-220	7.9	7722	88%
1 JIVI	F3INI300_9_INI3A_FILISDUIGII_G	0004	1,700	U	1,432	1,700	44.00	313	1 JIVI	BGE_10_MSA_Baltimore-	0700	040	1,505	-470	-1,000	32.03	-220	7.5	1122	00 /0
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47	561	PJM	Towson_L	8760	845	1,565	-478	-1,030	52.69	-220	8.2	7761	88%
										BGE_5_MSA_Baltimore-										
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	44.80	579	PJM	Towson_L	8760	263	1,462	-774	-1,495	52.56	-356	7.8	7723	88%
				_						BGE_5_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47	561	PJM	Towson_L	8760	263	1,462	-774	-1,495	52.56	-356	8.1	7763	88%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	_	1,492	1,700	44.80	570	PJM	BGE_9_MSA_Baltimore- Towson_L	8760	0	1,186	-690	-1,231	53.00	-320	8.2	7742	88%
PJIVI	PJM500_9_MSA_PILISBUIGII_G	0004	1,700	U	1,492	1,700	44.60	5/8	PJIVI	BGE_9_MSA_Baltimore-	0/60	U	1,100	-090	-1,231	53.00	-320	0.2	7742	00%
PJM	PJM500 3 MSA Pittsburgh G	8760	1,705	0	1,440	1,700	44.47	561	PJM	Towson L	8760	0	1,186	-690	-1,231	53.00	-320	8.5	7770	88%
MISO	IPL 2 MSA Jasper G	8760	1,678	0	1,414	1,664	37.13		MISO	CIN 1 MSA Indianapolis L	8760	816	4,274	-2,273	-3.748	38.45	-765	1.3	2867	33%
MISO	LGEE 3 GEN Gehnt2 G	8760	2.000	225	1,554	1,900	36.63		MISO	CIN 1 MSA Indianapolis L	8760	816	4,274	-2.273	-3.748	38.45	-765	1.8	4938	56%
MISO	CIN 8 MSA Evansville G	8760	3,657	260	2,516	3,391	37.24		MISO	CIN 1 MSA Indianapolis L	8760	816	4.274	-2,273	-3.748	38.45	-765	1.2	2960	34%
MISO	NIPS_8_MSA_Chicago_G	8658	2,892	1,694	844	1,541	36.43	266	MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,748	38.45	-765	2.0	691	8%
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41		MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,748	38.45	-765	8.0	3753	43%
MISO	NIPS_8_MSA_Chicago_G	8658	2,892	1,694	844	1,541	36.43		MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-884	-1,480	37.57	-291	1.1	634	7%
VACAR	DUK_9_MSA_Charlotte_G	8544	14,681	9,966	3,002	5,557	43.40		VACAR	CPLE_1_MSA_Durham_G	1153	10,224	8,563	-441	-1,529	50.02	-25	6.6	622	7%
PJM	VAP_7_G	6808	4,179	303	1,699	3,608	48.73		VACAR	CPLE_1_MSA_Durham_G	1153	10,224	8,563	-441	-1,529	50.02	-25	1.3	5106	58%
VACAR	SCEG_1_MSA_Columbia_G	8179	4,954 1,911	2,752	1,057	2,537	45.11 47.89	390		CPLE_1_MSA_Durham_G	1153	10,224	8,563	-441 -441	-1,529	50.02	-25	4.9	2366	27%
VACAR VACAR	DUK_5_MSA_Seneca_G SCPSA_10_MSA_Charleston_G	6597 8760	1,911	0	1,031 1,428	1,911	44.59		VACAR VACAR	CPLE_1_MSA_Durham_G	1153 1153	10,224 10,224	8,563 8,563	-441 -441	-1,529 -1,529	50.02 50.02	-25 -25	2.1 5.4	4662 1701	53% 19%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,079	1,680 10,227	44.59		VACAR	CPLE_1_MSA_Durham_G CPLE 1 MSA Durham G	1153	10,224	8,563	-441	-1,529	50.02	-25	9.5	6794	77%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,079	10,227	40.55	2,159		DUK 4 MSA Greenville L	7310	3,546	4,489	-613	-2.063	44.21	-198	3.7	4415	50%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	6.079	10,227	40.55	2,159		DUK 8 MSA Charlotte L	8760	1,407	4.886	-2.234	-3.877	44.01	-861	3.5	3790	43%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76	508		DUK 9 MSA Charlotte G	216	14,681	9,966	-493	-2,175	66.08	-7	22.3	2647	30%
	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	708	VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	22.4	2587	29%
VACAR	SCEG_1_MSA_Columbia_G	8179	4,954	2,752	1,057	2,537	45.11	390	VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	21.0	249	3%
VACAR	DUK_5_MSA_Seneca_G	6597	1,911	0	1,031	1,911	47.89		VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	18.2	27	0%
VACAR	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	336		DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	21.2	342	4%
	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23	1,980		DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	21.9	558	6%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55		VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	25.5	3985	45%
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15	1,639	VACAR	DUK_9_MSA_Charlotte_G	216	14,681	9,966	-493	-2,175	66.08	-7	21.9	890	10%
SOUTHERN	SOCO_32_MSA_Pascagoula_G AEPW 5 MSA Tulsa G	7963 7078	3,574 4,226	2,674	582 392	1,585 1,198	44.54 36.54	206	VACAR ENTERGY	DUK_9_MSA_Charlotte_G EES 1 MSA Jackson L	216 8760	14,681 3,218	9,966 3,066	-493 -1,410	-2,175 -2,066	66.08 42.17	-7 E21	21.5 5.6	2437 2899	28%
SPP	AEPW_5_MSA_Tulsa_G AEPW_9_MSA_MountPleasant_	7078 7520	8,168	2,571 3,832	657	1,198	40.94	202	ENTERGY	EES_1_MSA_Jackson_L EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,410 -1,410	-2,066	42.17	-521 -521	1.2	2899 8715	33% 99%
0	EES_9_MSA_MountPleasant_	2760	6,123	4,517	188	1,044	34.33			EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,410 -1,410	-2,066	42.17	-521	7.8	2745	31%
		2,00	0,120	4,017	100	1,044	04.00	10	L. 11 LIXO 1	ZZOWO/GGGGGGT_E	5,00	5,210	5,500	1,-10	2,000	74.17	JZ 1	7.0	2140	5176
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23	1,980	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	4.2	7018	80%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15	1,639	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	4.3	7010	80%
	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	206	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	3.9	6752	77%
	_																			
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76	508	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	4.7	6965	79%
ENTERGY	EES_8_MSA_BatonRouge_G	8496	1,060	0	1,059	1,060	42.39	381	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	6.0	5394	61%
ENTERGY	EES_4_GEN_Ouachita_G	6486	6,345	2,417	1,390	3,642	44.78	404	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	3.6	6488	74%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub II	nformation								Sink Hub Inf	ormation								Congestion	Indicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
			_	_										, ,	, ,	,	,			
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	708	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	4.7	6986	80%
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	14.1	6873	78%
000	458W 0 1104 M 1181	7500					40.04		ENITED ON	550 5 MOL N. O.		0.705			E 500	40.40	4 000	7.5	0744	2001
SPP	AEPW_9_MSA_MountPleasant_	7520	8,168	3,832	657	1,891	40.94	202	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	7.5	8714	99%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,346	1,750	42.43	500	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	6.0	6486	74%
SPP	AEDW E MCA Tules C	7078	4,226	2,571	202	1,198	36.54	101	ENTERCY	FFC F MCA NawOrlana C	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	11.0	6939	79%
SPP	AEPW_5_MSA_Tulsa_G	7078	4,226	2,571	392	1,198	36.54	101	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	11.9	6939	79%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,914	-5,532	48.42	-1,236	5.4	6529	74%
SPP	AEPW 9 MSA MountPleasant	7520	8,168	3,832	657	1,891	40.94	202	ENTERGY	EES_7_MSA_Beaumont- PortArthur G	6502	7,393	4,949	-497	-1,630	42.86	-138	1.9	8715	99%
355	AEFW_9_WOA_WOUNTRIEASANT_	7320	0,100	3,032	037	1,091	40.94	202	ENTERGI	EES_7_MSA_Beaumont-	0302	7,393	4,949	-431	-1,030	42.00	-130	1.9	67 13	9970
SPP	AEPW_5_MSA_Tulsa_G	7078	4,226	2,571	392	1,198	36.54	101	ENTERGY	PortArthur_G	6502	7,393	4,949	-497	-1,630	42.86	-138	6.3	4247	48%
ENTERGY	EES 9 MSA Russellville G	2760	6,123	4,517	188	1,044	34.33	18	ENTERGY	EES_7_MSA_Beaumont- PortArthur G	6502	7,393	4.949	-497	-1,630	42.86	-138	8.5	7219	82%
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,926	2,737	40.63	684	ENTERGY	EES_9_MSA_Russellville_G	6000	6,123	4,517	-452	-2,066	44.29	-120	3.7	1843	21%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,346	1,750	42.43		ENTERGY	EES_9_MSA_Russellville_G	6000	6,123	4,517	-452	-2,066	44.29	-120	1.9	0	0%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99		ENTERGY	EES_9_MSA_Russellville_G	6000	6,123	4,517	-452	-2,066	44.29	-120	1.3	0	0%
ENTERGY SPP	AECI_4_GEN_NewMadrid1_G AEPW 9 MSA MountPleasant	8760 7520	2,315 8,168	248 3.832	1,080 657	1,590 1,891	37.65 40.94		ENTERGY ENTERGY	EES_9_MSA_Russellville_G EES_9_MSA_Russellville_G	6000 6000	6,123 6,123	4,517 4,517	-452 -452	-2,066 -2,066	44.29 44.29	-120 -120	6.6 3.4	3522 8716	40% 99%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.94	745		EES_9_MSA_Russellville_G	6000	6,123	4,517	-452 -452	-2,066	44.29	-120	3.4	3043	35%
SPP	AEPW_5_MSA_Tulsa_G	7078	4,226	2,571	392	1,198	36.54	101		EES_9_MSA_Russellville_G	6000	6,123	4,517	-452	-2,066	44.29	-120	7.8	265	3%
TVAUTHOR	TVA 1 MSA Chatt-Hunts G	8755	17,334	9,966	3,029	7,429	41.20	1,092	ENTERGY	EES 9 MSA Russellville G	6000	6,123	4,517	-452	-2,066	44.29	-120	3.1	1658	19%
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,388	1,802	40.46		MISO	FE_5_MSA_Cleveland_L	8040	3,216	4,680	-570	-2,443	41.75	-191	1.3	2229	25%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34	681	MISO	FE_5_MSA_Cleveland_L	8040	3,216	4,680	-570	-2,443	41.75	-191	1.4	4061	46%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55		MISO	FE_5_MSA_Cleveland_L	8040	3,216	4,680	-570	-2,443	41.75	-191	1.2	4297	49%
PJM	DLCO_7_MSA_Pittsburgh_G	8232 7963	1,644	25	1,367	1,632	40.16 44.54		MISO	FE_5_MSA_Cleveland_L	8040	3,216	4,680	-570	-2,443	41.75 49.76	-191	1.6	4200	48% 54%
	SOCO_32_MSA_Pascagoula_G SOCO_31_MSA_Atlanta_G	7963 8760	3,574 11,765	2,674 1,583	582 4,237	1,585 9,393	44.54		FRCC FRCC	FPC_3_MSA_Orlando_L FPC_3_MSA_Orlando_L	8760 8760	1,232 1,232	3,649 3,649	-2,012 -2,012	-3,788 -3,788	49.76	-877 -877	5.2 5.6	4736 4648	54%
	SOCO_31_MSA_Atlanta_G SOCO 28 MSA Birmingham G	8760	2.535	1,090	1,325	1.876	43.76		FRCC	FPC 3 MSA Orlando L	8760	1,232	3,649	-2,012	-3,788	49.76	-877	6.0	4644	53%
	SOCO 15 MSA Birmingham G	8438	12,464	9,217	1,920	5,437	43.71		FRCC	FPC 3 MSA Orlando L	8760	1,232	3,649	-2.012	-3.788	49.76	-877	6.0	4646	53%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23	1,980	FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,012	-3,788	49.76	-877	5.5	4639	53%
	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54		FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,542	-2,658	50.34	-680	5.8	5076	58%
	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23		FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,542	-2,658	50.34	-680	6.1	5017	57%
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15		FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,542	-2,658	50.34	-680	6.2	5020 5020	57%
	SOCO_15_MSA_Birmingham_G SOCO 28 MSA Birmingham G	8438 8760	12,464 2,535	9,217 1,090	1,920 1,325	5,437 1,876	43.71 43.76		FRCC FRCC	FPC_4_MSA_Tampa_L FPC 4 MSA Tampa L	8760 8760	2,239 2,239	2,873 2,873	-1,542 -1,542	-2,658 -2,658	50.34 50.34	-680 -680	6.6 6.6	5020	57% 57%
	SOCO 26 MSA Macon G	8760	6.802	1,030	5,111	6,381	44.23		FRCC	FPL 2 MSA FortMyers G	8701	5.929	4.563	-1,342	-2,761	51.01	-568	6.8	5335	61%
FRCC	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,364	1,584	49.56		FRCC	FPL 2 MSA FortMyers G	8701	5,929	4,563	-1,280	-2,761	51.01	-568	1.5	5142	59%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	206	FRCC	FPL_2_MSA_FortMyers_G	8701	5,929	4,563	-1,280	-2,761	51.01	-568	6.5	5400	61%
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15		FRCC	FPL_2_MSA_FortMyers_G	8701	5,929	4,563	-1,280	-2,761	51.01	-568	6.9	5338	61%
	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71		FRCC	FPL_2_MSA_FortMyers_G	8701	5,929	4,563	-1,280	-2,761	51.01	-568	7.3	5344	61%
	SOCO_28_MSA_Birmingham_G	8760 8760	2,535 6,802	1,090	1,325 5,111	1,876 6,381	43.76 44.23		FRCC FRCC	FPL_2_MSA_FortMyers_G FPL 3 MSA Miami L	8701 8760	5,929 6,944	4,563 7.089	-1,280 -2 107	-2,761 -4,333	51.01 51.48	-568 -991	7.2 7.3	5341	61%
	SOCO_26_MSA_Macon_G SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	44.23		FRCC	FPL_3_MSA_Miami_L FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197 -2,197	-4,333 -4.333	51.48	-991 -991	7.8	5241 5246	60% 60%
FRCC	SEC 6 MSA Palatka G	8760	1,330	0,217	1,135	1,330	50.10		FRCC	FPL 3 MSA Miami L	8760	6,944	7,089	-2,197	-4,333	51.48	-991	1.4	4906	56%
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197	-4,333	51.48	-991	7.3	5242	60%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	206	FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197	-4,333	51.48	-991	6.9	5294	60%
FRCC	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,364	1,584	49.56	577	FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197	-4,333	51.48	-991	1.9	5236	60%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,197	-4,333	51.48	-991	7.7	5244	60%
	SOCO_31_MSA_Atlanta_G SOCO 28 MSA Birmingham G	8760 8760	11,765 2,535	1,583 1,090	4,237 1,325	9,393 1,876	44.15 43.76	1,639 508		FPL_7_MSA_Miami_L FPL 7 MSA Miami L	8760 8760	570 570	3,923 3,923	-2,634 -2,634	-4,256 -4,256	51.45 51.45	-1,187 -1,187	7.3 7.7	5277 5277	60% 60%
	SOCO_28_MSA_Birmingnam_G SOCO 26 MSA Macon G	8760	6,802	1,090	5,111	6,381	44.23		FRCC	FPL_7_MSA_MIAMI_L FPL 7 MSA MIAMI L	8760	570 570	3,923	-2,634 -2,634	-4,256 -4,256	51.45	-1,187	7.7	5277	60%
	SOCO_26_MSA_Macon_G	8438	12,464	9,217	1.920	5,437	43.71		FRCC	FPL 7 MSA Miami L	8760	570	3,923	-2,634	-4,256	51.45	-1,187	7.7	5279	60%
FRCC	SEC_6_MSA_Palatka_G	8760	1,330	0,217	1,135	1,330	50.10		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,634	-4,256	51.45	-1,187	1.4	4971	57%
FRCC	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,364	1,584	49.56		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,634	-4,256	51.45	-1,187	1.9	5289	60%
	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,634	-4,256	51.45	-1,187	6.9	5323	61%
MISO	XEL_3_MSA_Minneapolis_G	2885	7,596	7,622	602	1,657	17.87		MISO	GRE_4_MSA_Minneapolis_L	8760	331	1,111	-1,099	-2,103	31.83	-307	14.0	6	0%
	ITC_3_MSA_Detroit_G	8745	3,815	1,600	1,235	2,005	41.95		ONTARIO	IESO_11_G	8760	9,529	12,779	-3,043	-7,371	44.44	-1,184	2.5	7753	88%
MISO MISO	ITC_7_MSA_Monroe_G	8472 8472	1,500 1,500	0	1,344 1,344	1,500 1,500	41.48 41.48		ONTARIO ONTARIO	IESO_11_G	8760 8760	9,529 1,964	12,779	-3,043 -2,360	-7,371 -3,239	44.44 44.27	-1,184 -915	3.0	6042 5873	69%
	ITC_7_MSA_Monroe_G ITC 3 MSA Detroit G	8472 8745	3,815	1,600	1,344	2,005	41.48			IESO_15_G IESO_15_G	8760	1,964	3,375 3,375	-2,360	-3,239	44.27	-915 -915	2.8 2.3	7255	67% 83%
IVIIOO	I I O_O_IVIOA_DELIUIL_G	0740	3,015	1,000	1,235	2,005	41.95	400	CIVIANIO	1200_10_0	0700	1,904	3,315	-2,300	-3,239	44.27	-915	2.3	1200	03%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion	Indicators	$\overline{}$
					Average									Average				•		
		0	0	1	net	Max net	Average	Revenue			0:-1-	0	Local	net	Max net	Average	Revenue	Delete	U90	
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	Hours	U90 %
MISO	ITC 7 MSA Monroe G	8472	1,500	vveignt 0	1.344	1.500	41.48		ONTARIO	IESO 3 L	8760	39	1,696	-1.181	-1.636	43.42	-449	1.9	7882	90%
MISO	ITC_3_MSA_Detroit_G	8745	3,815	1,600	1,235	2,005	41.95		ONTARIO	IESO_3_L	8760	39	1,696	-1,181	-1,636	43.42	-449	1.5	7408	84%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,414	1,664	37.13		MISO	IPL_5_MSA_Indianapolis_L	8760	306	1,187	-784	-1,258	38.66	-266	1.5	2582	29%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,516	3,391	37.24	821	MISO	<pre>IPL_5_MSA_Indianapolis_L</pre>	8760	306	1,187	-784	-1,258	38.66	-266	1.4	6131	70%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,516	3,391	37.24		MISO	IPL_8_MSA_Indianapolis_L	8760	547	1,227	-531	-1,094	38.73	-180	1.5	6188	70%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,414	1,664	37.13		MISO	IPL_8_MSA_Indianapolis_L	8760	547	1,227	-531	-1,094	38.73	-180	1.6	2640	30%
MISO MISO	FE_9_MSA_Weirton_G FE 6 MSA Pittsburgh G	8760 8592	1,860 2,371	112 213	1,388 1,964	1,802 2,290	40.46 40.34		MISO MISO	ITC_2_MSA_Detroit_L ITC 2 MSA Detroit L	8625 8625	4,001 4,001	5,247 5,247	-1,114 -1,114	-3,583 -3,583	41.97 41.97	-403 -403	1.5 1.6	6416 6980	73% 79%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	40.34		MISO	ITC 9 MSA Detroit L	8760	1,340	4,751	-2,179	-4,538	41.85	-799	1.5	7682	87%
MISO	FE 9 MSA Weirton G	8760	1,860	112	1,388	1,802	40.46		MISO	ITC 9 MSA Detroit L	8760	1,340	4,751	-2,179	-4,538	41.85	-799	1.4	7322	83%
			.,		.,	.,					0.00	.,	.,	_,	.,					
SPP	WERE_1_MSA_Manhattan_G	8641	2,988	409	1,327	2,260	31.79	365	SPP	KACP_7_MSA_KansasCity_L	8760	0	1,291	-730	-1,422	36.39	-233	4.6	771	9%
MISO	BREC_3_County_Webster_G	8760	1,355	476	879	1,156	35.98		MISO	LGEE_5_MSA_Lexington_L	8760	595	2,345	-1,786	-2,997	37.32	-584	1.3	2763	31%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	911	1,379	34.17		MISO	METC_8_MSA_BayCity_G	8149	3,795	2,562	-600	-1,641	42.36	-207	8.2	5208	59%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159	MISO	METC_8_MSA_BayCity_G	8149	3,795	2,562	-600	-1,641	42.36	-207	1.8	3176	36%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,079	10,227	40.55	2,159	MISO	METC_9_MSA_Kalamazoo_L	8760	118	1,334	-812	-1,476	41.72	-297	1.2	1194	14%
i Jivi	AEF_0_GEN_AIIIUSU1_G	0/00	19,094	0,344	0,079	10,227	40.55	۷, ۱۵9	IVIIOU	IVIL I O_9_IVIOA_RaidIIIdZ00_L	0/00	110	1,334	-012	-1,4/0	41.72	-297	1.2	1194	14%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	911	1,379	34.17	268	MISO	METC 9 MSA Kalamazoo L	8760	118	1,334	-812	-1.476	41.72	-297	7.6	4687	53%
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86		NEPOOL	NEPOOL_10_RI	6779	2,062	2,203	-410	-1,213	51.13	-142	6.3	6123	70%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46		NEPOOL	NEPOOL_10_RI	6779	2,062	2,203	-410	-1,213	51.13	-142	2.7	8760	100%
NEPOOL	NEPOOL_2_NH	8396	4,204	2,621	933	1,787	49.91		NEPOOL	NEPOOL_10_RI	6779	2,062	2,203	-410	-1,213	51.13	-142	1.2	6923	79%
NEPOOL	NEPOOL_3_ME	3621	3,494	2,522	285	1,072	48.84		NEPOOL	NEPOOL_10_RI	6779	2,062	2,203	-410	-1,213	51.13	-142	2.3	6904	79%
NEPOOL	NEPOOL_2_NH	8396	4,204	2,621	933	1,787	49.91		NEPOOL	NEPOOL_4_NEBOS	8727	3,262	5,904	-1,533	-3,500	51.56	-690	1.7	6923	79%
NEPOOL NYPP	NEPOOL_3_ME	3621	3,494 4,946	2,522 2,500	285 1,634	1,072	48.84 44.86	50	NEPOOL NEPOOL	NEPOOL_4_NEBOS NEPOOL_4_NEBOS	8727	3,262	5,904	-1,533 -1,533	-3,500 -3,500	51.56 51.56	-690 -690	2.7 6.7	6920 6123	79% 70%
NYPP	NYISO_1_NYA NYISO 3 NYC	8310 8760	6,711	2,500	1,899	2,263 3,352	48.46		NEPOOL	NEPOOL_4_NEBOS	8727 8727	3,262 3,262	5,904 5,904	-1,533	-3,500	51.56	-690	3.1	8760	100%
NEPOOL	NEPOOL 3 ME	3621	3,494	2,522	285	1.072	48.84	50		NEPOOL 6 WCMA	8554	4.285	3,417	-1,033	-3,107	51.63	-454	2.8	7027	80%
NEPOOL	NEPOOL 2 NH	8396	4.204	2,621	933	1,787	49.91	391	NEPOOL	NEPOOL 6 WCMA	8554	4,285	3,417	-1.028	-3,107	51.63	-454	1.7	7045	80%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46	806	NEPOOL	NEPOOL_6_WCMA	8554	4,285	3,417	-1,028	-3,107	51.63	-454	3.2	8570	98%
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86	609		NEPOOL_6_WCMA	8554	4,285	3,417	-1,028	-3,107	51.63	-454	6.8	6125	70%
NEPOOL	NEPOOL_2_NH	8396	4,204	2,621	933	1,787	49.91	391		NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	-35	6.9	7640	87%
NEPOOL	NEPOOL_3_ME	3621	3,494	2,522	285	1,072	48.84		NEPOOL	NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	-35	7.9	7617	87%
NYPP NEPOOL	NYISO_1_NYA NEPOOL 5 SEMA	8310 8760	4,946 6,454	2,500 3,978	1,634 1.839	2,263 3,523	44.86 51.63		NEPOOL NEPOOL	NEPOOL_7_CT NEPOOL 7 CT	1561 1561	4,447 4,447	3,920 3,920	-397 -397	-1,722 -1,722	56.77 56.77	-35 -35	11.9 5.1	6127 2659	70% 30%
NYPP	NYISO 8 NYH	8760	2,021	973	1,570	1,958	53.34		NEPOOL	NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	-35	3.4	8752	100%
NYPP	NYISO 3 NYC	8760	6,711	2,657	1,899	3,352	48.46		NEPOOL	NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	-35	8.3	8760	100%
NEPOOL	NEPOOL 8 SWCT	6096	2,678	1,850	412	1,717	55.63		NEPOOL	NEPOOL 7 CT	1561	4,447	3,920	-397	-1,722	56.77	-35	1.1	7361	84%
NYPP	NYISO_6_NYF	7576	4,103	1,983	579	1,680	50.77	223	NEPOOL	NEPOOL_7_CT	1561	4,447	3,920	-397	-1,722	56.77	-35	6.0	8749	100%
NEPOOL	NEPOOL_2_NH	8396	4,204	2,621	933	1,787	49.91	391	NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-731	-1,289	53.08	-340	3.2	8758	100%
NYPP	NYISO_6_NYF	7576	4,103	1,983	579	1,680	50.77	223	NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-731	-1,289	53.08	-340	2.3	8759	100%
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-731	-1,289	53.08	-340	8.2	6133	70%
NEPOOL NEPOOL	NEPOOL_7_CT NEPOOL 5 SEMA	7199 8760	4,447 6,454	3,920 3,978	629 1,839	1,694 3,523	51.70 51.63		NEPOOL NEPOOL	NEPOOL_9_NWKST NEPOOL 9 NWKST	8760 8760	405 405	1,524 1,524	-731 -731	-1,289 -1,289	53.08 53.08	-340 -340	1.4 1.4	8757 8756	100% 100%
NEPOOL	NEPOOL_5_SEIVIA	3621	3,494	2,522	285	1,072	48.84		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-731	-1,289	53.08	-340	4.2	8757	100%
NYPP	NYISO 3 NYC	8760	6,711	2,657	1.899	3,352	48.46		NEPOOL	NEPOOL 9 NWKST	8760	405	1,524	-731	-1,289	53.08	-340	4.6	8760	100%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,684	2,314	30.23		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	-1,782	6.4	2910	33%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	911	1,379	34.17	268	PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	-1,782	2.4	3987	45%
MISO	IP_8_GEN_Clinton_G	8002	2,302	1,195	927	1,212	35.59			NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	-1,782	1.0	1287	15%
MISO	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41	119		NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	-1,782	6.2	6423	73%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	32.91		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,558	-9,590	36.59	-1,782	3.7	3161	36%
MISO MISO	ALTE_2_MSA_Madison_G	8747 8592	1,665 1,728	441 303	494 911	1,033 1,379	30.31 34.17		PJM PJM	NI_13_MSA_Chicago_L	8760 8760	2,396	10,556 1,205	-5,558 -638	-9,590 -1,267	36.59 36.47	-1,782	6.3	4833 3712	55% 42%
MISO	WEC_1_MSA_Chicago_G AMRN 12 MSA StLouis L	6277	5,059	6,066	626	1,379	34.17			NI_3_MSA_Chicago_L NI 3 MSA Chicago L	8760	26 26	1,205	-638	-1,267	36.47	-204 -204	2.3 6.1	6374	73%
MISO	ALTE 2 MSA Madison G	8747	1,665	441	494	1,037	30.41		PJM	NI 3 MSA Chicago L	8760	26	1,205	-638	-1,267	36.47	-204	6.2	4843	55%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	32.91		PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	36.47	-204	3.6	3198	36%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,684	2,314	30.23		PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	36.47	-204	6.2	2944	34%
	ALTE_2_MSA_Madison_G	8747	1,665	441	494	1,033	30.31	131		NI_6_MSA_Chicago_G	1095	9,759	7,577	-312	-1,427	35.18	-12	4.9	4510	51%
	AMRN_12_MSA_StLouis_L	6277	5,059	6,066	626	1,857	30.41			NI_6_MSA_Chicago_G	1095	9,759	7,577	-312	-1,427	35.18	-12	4.8	6423	73%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,684	2,314	30.23		PJM	NI_6_MSA_Chicago_G	1095	9,759	7,577	-312	-1,427	35.18	-12	4.9	2939	33%
MISO PJM	WEC_1_MSA_Chicago_G	8592 8760	1,728 2,290	303	911 2.119	1,379	34.17		PJM PJM	NI_6_MSA_Chicago_G NI_6_MSA_Chicago_G	1095 1095	9,759 9,759	7,577 7.577	-312 -312	-1,427 -1,427	35.18	-12 -12	1.0	3985	45%
ONTARIO	NI_7_MSA_Rochelle_G IESO_7_G	8760	2,290	253	2,119	2,290 2,829	32.91 44.11		NYPP	NYISO 10 NYJ	8760	10,283	11,493	-312	-1,427	35.18 54.91	-1,653	2.3 10.8	3239 8760	37% 100%
NYPP	NYISO 6 NYF	7576	4,103	1,983	579	1,680	50.77		NYPP	NYISO_10_NTJ	8760	10,283	11,493	-3,436	-5,455	54.91	-1,653	4.1	8758	100%
NEPOOL	NEPOOL_5_SEMA	8760	6,454	3,978	1,839	3,523	51.63		NYPP	NYISO 10 NYJ	8760	10,283	11,493	-3,436	-5,455	54.91	-1,653	3.3	8760	100%
		0.00	3, .54	0,0.0	.,555	5,020	000	552		7	0.00	. 5,250	,	5, .50	5, .00	3 1	.,550	0.0	0.00	.00,0

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

No.	Source Hub	Information								Sink Hub Info	ormation								Congestion I	ndicators	$\overline{}$
March   Marc									_												
More			Source	Gen	Load							Sink	Gen	Load					Price	1190	
SPECIAL   CF   766   444   360   53   566   518   249   769   74	Market Area	Hub Name								Market Area	Hub Name										U90 %
PAY PREFIELD VINNAL BERT 1978 1 1996 1 1976 1 1978		NEPOOL_7_CT			3,920	629	1,694	51.70	234	NYPP		8760	10,283	11,493	-3,436	-5,455		-1,653	3.2	8758	100%
NOTE OF STATE AND ADDRESS OF S												0.00									
Dividing   1502_X																					
NYSSE B. NYS																					
OPTATION   SECULAR   167   2-685   279   441   360   646   646   647   648   646																					
REPOLD, REPOLD, 2 HIT																			10.8		
REPOL 7 CT																					
NYPE OF NYPE O																					
NYPP NYSO   NYA   STO   4.586   2.500   1.634   2.205   4.488   DEGNYPP NYSO   1.18YK   DFG   5.505   5.208   1.912   2.885   5.64   2.825   1.11   6.133   700																					
OPTARD   SEO_T G																					
NEPOCU, REPOCU, 2, PM																					
NEPOCL NEPOCL 5 ERIA	NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46	806	NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,912	-2,882	55.40	-928	6.9	8760	100%
NPPOL NPSOL 3 EVYP																					
SEPOCL   NEPOCL & IMERICAL   SEPOC																					
PAM PRINTEC 2 MSA Cultion G 6001 2772 1198 846 1478 4578 3358/YPP NYSS 11 NYK 8706 5,681 5,289 1-1912 - 2,880 56.48 928 9 6 6103 770 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																					
ONTARIO ESO 6 G 8760 2,140 147 2,403 2,770 44.14 9030NYPP NYSO 11NYK 8760 5,681 5,280 131 2,880 56.4 928 11.3 61.50 770 10NTARIO ESO 7 C 10NTARIO ESO 8 C 10NTARIO ESO 9 C 1 NTARIO ESO 9 C 1 NTA																					
ONTARIO ESO 2 G																					
PAMERIC C. J. MAS. Dubbin. G.   8001   2724   1198   348   1678   4578   338\pmp   NYSD_T.NYG   8164   3158   2198   777   1.766   5155   324   5.8   6074	ONTARIO	IESO_2_G	1918	2,437	2,116		1,026	51.27			NYISO_11_NYK	8760				-2,882	55.40	-928	4.1		70%
ONTARIO (ESO, 6 G																					
NEPOOL 2, PM																					
ONTARIO ESO, 7 G																			7.5		
NYPP NYSO 3 NYC 8760 6,711 2,607 1,589 3,352 48.48 600NYPP NYSO 7,NYG 8164 3,158 2,195 7,77 1,708 5155 3.24 2,7 5602 683																			7.6		
NEPOCL NEPOCL_SME  3621 3,494 2,522 285 1,072 48,84 50,NYPP NYSO NYI 8288 2 1,476 484 2,165 427 380 5,6 6001 699 NREPOCL NEPOCL_SMH  3636 4,204 2,621 633 1,767 49,91 331 NYPP NYSO NYI 8288 2 1,476 484 2,165 427 380 5,4 6001 699 NREPOCL NEPOCL_SMH  3636 4,204 2,621 633 1,767 49,91 321 NYPP NYSO NYI 8288 2 1,476 484 2,165 427 380 4,4 6743 10076 NYREPOCL_SMH  3636 4,204 2,621 633 1,767 49,91 321 NYPP NYSO NYI 8288 2 1,476 484 2,165 427 380 4,4 6743 10076 NYREPOCL_SMH  3650 4,004 1,984 2,497 2,116 284 1,168 3,168 2,168 2,168 2,168 3																					
NEPOOL NEPOOL 2 NEPOO																					
ONTARIO   ISSO 2_G	1 0111												2								
NYFP NYSO 6.NYF 7576 4,103 1,983 579 1,868 50.77 223NYPP NYSO 9.NYI 8288 2 1,476 845 2,168 54.27 3.380 3.3 8615 98% OTTARIO ISSO 6.G 8760 2,146 147 2,438 2,787 44.10 985NYPP NYSO 9.NYI 8288 2 1,476 846 2,2168 54.27 3.380 10.2 612 70% NEPOOL													2								
ONTARIO   ISSO 6 G   8760   2,146   147   2,439   2,787   44.10   963NYPP   NYISO 9, NYI   82.88   2   1,476   84.85   2,165   54.27   330   10.2   6121   70%   NEPOOL NEPOOL 3, ME   3621   3,494   2,522   28.6   1,072   48.84   50,000   1,000																					
NEPOOL NEPOOL, SPON SPON SPON SPON SPON SPON SPON SPON													2								
NEPOOL NEPOOL, 7CT													2								
NEPOOL NEPOOL SEMA 8760 6.464 3.978 1.839 3.523 51.63 832MYPP NYISO 9.NYI 8288 2 1.476 848 2.165 64.27 380 2.8 883.0 99.5 NYTENTRY NYISO 9.NYI 8288 2 1.476 848 2.165 64.27 380 10.2 6123 70% 10.2 612													2						2.6		
ONTARIO   IESO 7 G		NYISO_3_NYC									NYISO_9_NYI		2								
NYPP NYISO_1,NYA 8310 4,946 2,500 1,834 2,263 44.86 609 NYPP NYISO_9,NYI 8288 2 1,476 -845 -2,165 54.27 -380 9.4 6092 69% SPP AEPW_5,MSA_Tulsa_G 7076 4,226 2,571 392 1,198 36.54 101 SPP L L 874,MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 19.3 6394 73% SPP WERE_1,MSA_Manhatan_G 8641 2,988 499 1,327 2,260 31.79 365 SPP OKGE 4,MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 15.2 7720 88% SPP WERE_1,MSA_Manhatan_G 8641 2,988 499 1,327 2,260 31.79 365 SPP OKGE 4,MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 24.0 8218 94% SPP AEPW_9,MSA_MouniPleasant 7520 8,168 3,832 657 1,891 40.94 202SPP L L 874,MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77% SPP AEPW_9,MSA_MSA_Russeliville_G 2760 6,123 4,517 188 1,044 34.33 18SPP L L 874,MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 24.0 8218 94.0 MAPP NPD_4,GEN_Gentleman_G 8240 2,702 148 822 1,1745 15.41 104MAPP DPD_4,GEN_Gentleman_G 8240 2,702 148 822 1,1745 15.41 104MAPP DPD_4,GEN_Gentleman_G 8240 2,702 148 822 1,1745 15.41 104MAPP NPD_4,GEN_Gentleman_G 890 2,383 0 1,675 3,295 5,222 760 PJM PCD_5,MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 2,7 3910 45% PJM PJMS00_3,MSA_Philadelphia_G 8890 2,383 0 1,675 3,295 5,222 760 PJM PCD_5,MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3,7 1444 16% PJMS00_3,MSA_PRISburgh_G 8760 1,705 0 1,440 1,700 44.47 551 PJM PEPCO_1,MSA_DC_L 8760 0 1,438 -883 1,1547 5,258 -407 7,8 7616 87% PJM PJMS00_9,MSA_PRISburgh_G 8664 1,700 0 1,4692 1,700 44.88 578 PJM PEPCO_1,MSA_DC_L 8760 0 1,438 -883 1,1547 5,258 -407 7,8 7616 87% PJM PJMS00_9,MSA_PRISburgh_G 8601 1,700 0 1,4692 1,700 44.88 578 PJM PEPCO_1,MSA_DC_L 8760 0 1,438 -883 1,1547 5,258 -407 7,8 7616 87% PJM PJMS00_9,MSA_PRISburgh_G 8601 1,700 0 1,440 1,700 44.48 578 PJM PLS_MSO_0,MSA_PRISburgh_G 8601 1,700 0 1,440 1,700 44.48 578 PJM PLS_MSO_0,MSA_PRISburgh_G 8601 1,700 0 1,440 1,700 44.48 578 PJM PLS_MSO_0,MSA_PRISburgh_G 8601 1,700 0 1,440 1,700 44.47 561 PJM PLS_MSO_0,MSA_PRISburgh_G 8601 1,700 0 1,440 1,70													2								
SPP AEPW 5 MSA Tulsa G 7078 4,226 2,571 392 1,198 36.54 101 SPP L													2								
SPP   AEPW_5_MSA_Tulsa_G	NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86	609	NYPP		8288	2	1,476	-845	-2,165	54.27	-380	9.4	6092	69%
ENTERGY EES 2 MSA Batesville G 8743 3.525 1,697 1,926 2,737 40,63 684SPP L 8742 2,102 2,403 -796 -1,677 55.82 -389 15.2 7720 88% SPP WERE 1 MSA Manhattan, G 8641 2,988 409 1,327 2,260 31.79 365 SPP OKGE 4 MSA OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 24.0 8218 94% SPP AEPW 9 MSA MountPleasant, 7520 8,168 3,832 657 1,891 40,94 20 SPP L 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77% ENTERGY EES 9 MSA Russellville G 2760 6,123 4,517 188 1,044 34.33 18 SPP L 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77% OKGE 4 MSA OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77% ENTERGY EES 9 MSA Russellville G 2760 6,123 4,517 188 1,044 34.33 18 SPP L 8742 2,102 2,403 -796 -1,677 55.82 -389 21.5 7335 84% MAPP NPD 4 GEN Gentleman, G 8240 2,702 148 822 1,475 15.41 104 MAPP OPPD 5 MSA Omaha, L 8760 480 1,686 -854 -1,534 21.57 -161 6.2 7560 86% PJM BGE_7 MSA Battimore-Towsor 7816 2,548 1,043 608 1,238 53.27 258 PJM PECO_5 MSA Philadelphia L 6966 1,656 2,510 -394 -2,388 55.94 -153 2.7 3910 45% PJM 500 4, MSA Philadelphia C 8690 2,383 0 1,675 3,295 52.22 760 PJM PECO_5 MSA Philadelphia L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 0 0% PJM 500 4, MSA Philadelphia C 8690 1,705 0 1,440 1,700 44.47 561 PJM PECO_5 MSA Philadelphia L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16% PJM 500 3, MSA Phitsburgh G 8760 1,705 0 1,440 1,700 44.47 561 PJM PECO_1 MSA DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500 3, MSA Phitsburgh G 8760 1,705 0 1,440 1,700 44.0 579 PJM PECO_1 MSA DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500 3, MSA Phitsburgh G 8760 1,705 0 1,440 1,700 44.0 579 PJM PECO_1 MSA DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500 3, MSA Phitsburgh G 8760 1,705 0 1,440 1,700 44.67 561 PJM PECO_1 MSA DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500 3, MSA Phitsburgh G 8760 1,705 0 1,440 1,700 44.67 561 PJM PLS MSA Lancaster L 8760 0 897 -721 -1,027 51.75 -327 6.0 7664 87% PJM PJM500 3, MSA Phitsburgh G 8661 1,705 0 1,440 1,70	SPP	AFPW 5 MSA Tulsa G	7078	4 226	2 571	392	1 198	36 54	101	SPP	I	8742	2 102	2 403	-796	-1 677	55.82	-389	19.3	6394	73%
SPP   WERE_1_MSA_Manhattan_G	<u> </u>	/ILL W_O_ING/L_Falsa_O		1,220	2,071	002	1,100	00.01			OKGE_4_MSA_OklahomaCity	0.712	2,102	2,100		1,077	00.02	000	10.0	0001	
SPP AEPW 9 MSA_MountPleasant 7520 8,168 3,832 657 1,881 40.94 20,2 SPP L OKGE_4_MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77%   OKGE_4_MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 14.9 6720 77%   OKGE_4_MSA_OklahomaCity 8742 2,102 2,403 -796 -1,677 55.82 -389 21.5 7736 8749   MAPP NPPD_4_GEN_Gentleman_G 8240 2,702 148 822 1,475 15.41 104 MAPP OPPD_5_MSA_Omaha_L 8760 480 1,686 -854 -1,534 2,157 -161 6.2 7560 86%   PJM BGE_7_MSA_Baltimore-Towsor 7816 2,548 1,043 608 1,238 53.27 253 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 2.7 3910 45%   PJM PJM500_7_MSA_POK-Hanover 8760 2,383 0 1,675 3,295 52.22 760 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 0 0%   PJM PJM500_7_MSA_POK-Hanover 8760 2,696 0 2,071 2,570 52.28 948 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16%   PJM PJM500_7_MSA_POK-Hanover 8760 1,705 0 1,440 1,700 44.47 561 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87%   PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 578 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87%   PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 578 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87%   PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 578 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87%   PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 578 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87%   PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 578 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 1,027 51.75 -327 6,9 5782 66%   PJM PSNELEC_2_MSA_Dubols_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 1,027 51.75 -327 6,9 5782 83%   PJM PSNELEC_2_MSA_Dubols_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 5.8 759 83%   PJM PJM500_3_MSA_Pittsburgh_G 8664 1,700 0 1,4		EES_2_MSA_Batesville_G	8743	3,525	1,697	1,926	2,737	40.63			_L		2,102	2,403		-1,677	55.82	-389		7720	
SPP         AEPW_9_MSA_MountPleasant         7520         8,168         3,832         657         1,891         40.94         202 SPP         L         8742         2,102         2,403         -796         -1,677         55.82         -389         14.8         6720         77%           ENTERGY         EES_9_MSA_Russellville_G         2760         6,123         4,517         188         1,044         34.33         18 SPP         L         MRAP         1,677         55.82         -389         21.5         7335         84%           MAPP         NPPD_4_GEN_Gentleman_G         8240         2,702         148         822         1,475         15.41         104 MAPP         OPPD_5_MSA_Omaha_L         8760         480         1,686         -854         -1,534         21.57         -161         6.2         7560         86%           PJM         BGE_7_MSA_Baltimore-Towsor         7816         2,548         1,043         608         1,238         53.27         253 PJM         PECO_5_MSA_Philadelphia_L         6966         1,656         2,510         -394         -2,388         55.94         -153         3.7         0         0%           PJM         PJM500_4_MSA_PINSO_3_MSA_PINSO_3_MSA_PINSO_3_MSA_PINSO_3_MSA_PINSO_3_MSA_PINSO_3_MSA_PINSO_3_MS	SPP	WERE_1_MSA_Manhattan_G	8641	2,988	409	1,327	2,260	31.79	365	SPP		8742	2,102	2,403	-796	-1,677	55.82	-389	24.0	8218	94%
ENTERGY EES_9_MSA_Russellville_G	ODD	AEDIAL O MOA Massardis assart	7500	0.400	0.000	057	4 004	40.04	000	000	OKGE_4_MSA_OklahomaCity	0740	0.400	0.400	700	4.077	55.00	000	440	0700	770/
ENTERGY EES_9_MSA_Rusellville_G	522	AEPVV_9_IVISA_MountPleasant_	7520	8,168	3,832	657	1,891	40.94	202	1944	_L OKGE 4 MSA OklahomaCity	8/42	2,102	2,403	-796	-1,6/7	55.82	-389	14.9	6/20	//%
MAPP   NPPD_4_GEN_Gentleman_G   8240   2,702   148   822   1,475   15.41   104 MAPP   OPPD_5_MSA_Omaha_L   8760   480   1,686   -854   -1,534   21.57   -161   6.2   7560   86%	ENTERGY	EES 9 MSA Russellville G	2760	6.123	4.517	188	1.044	34.33	18	SPP	L	8742	2.102	2.403	-796	-1.677	55.82	-389	21.5	7335	84%
PJM BGE_7_MSA_Baltimore-Towsor 7816 2,548 1,043 608 1,238 53.27 253 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 2.7 3910 45% PJM PJM500_4_MSA_Philadelphia_L 8690 2,383 0 1,675 3,295 52.22 760 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 0 0% PJM PJM500_7_MSA_York-Hanover 8760 2,696 0 2,071 2,570 52.28 948 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16% PJM PJM500_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PPECO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.1 7624 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7612 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PLS_MSA_Lancaster_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7612 87% PJM PPECC_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7612 87% PJM PPECC_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7612 87% PJM PJM500_9_MSA_Pittsburgh_G 8661 1,700 0 1,492 1,700 44.80 579 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 69% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PS_MSA_DIS_BURG_G 8604 1,700 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 5.8 7259 83											OPPD_5_MSA_Omaha L										
PJM PJM500_4_MSA_Philadelphia_U 8690 2,383 0 1,675 3,295 52.22 760 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 0 0% PJM PJM500_7_MSA_York-Hanover 8760 2,696 0 2,071 2,570 52.28 948 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16% PJM PJM500_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PPECO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM AP_1_County_Harrison_G 8760 6,563 2,223 2,676 3,904 44.26 1,038 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PLS_MSA_Lancaster_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7622 87% PJM PSNELEC_2_MSA_DUBOis_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 669 PJM PJM500_3_MSA_Pittsburgh_G 8664 1,705 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5782 699 PJM PLS_MSA_																					ì
PJM PJM500_7_MSA_York-Hanover 8760 2,696 0 2,071 2,570 52.28 948 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16% PJM PJM500_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.1 7624 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7622 87% PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5764 69% PJM PJM500_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.0 7664 87% PJM PSM50_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PENELEC_2_MSA_Dubois_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PSM50_3_MSA_Pittsburgh_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PSM50_3_MSA_Pittsburgh_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 5.8 7259 83% PJM PJM500_3_MSA_Pittsburgh_G 8604 1,700 0 1,492 1,700 44.47 561 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJM PJM500_9_MSA_PIttsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJM PJM500_9_MSA_PITSburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJM500_9_MSA_PITSburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,03	PJM	BGE_7_MSA_Baltimore-Towsor	7816	2,548	1,043	608	1,238	53.27	253	PJM	PECO_5_MSA_Philadelphia_L	6966	1,656	2,510	-394	-2,388	55.94	-153	2.7	3910	45%
PJM PJMS00_7_MSA_York-Hanover 8760 2,696 0 2,071 2,570 52.28 948 PJM PECO_5_MSA_Philadelphia_L 6966 1,656 2,510 -394 -2,388 55.94 -153 3.7 1444 16% PJM PJMS00_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.1 7624 87% PJM PJMS00_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJMS00_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 7.8 7616 87% PJM PJMS00_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PEPCO_1_MSA_DC_L 8760 0 1,439 -883 -1,547 52.59 -407 8.3 7622 87% PJM PJMS00_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.9 5764 69% PJM PJMS00_3_MSA_Pittsburgh_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 6.0 7664 87% PJM PSMSLEC_2_MSA_DUBois_G 8760 1,705 0 1,440 1,700 44.47 561 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PENELEC_2_MSA_DUBois_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PSMSD0_3_MSA_Pittsburgh_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Lancaster_L 8760 0 897 -721 -1,027 51.75 -327 7.3 7234 82% PJM PSMSD0_3_MSA_Pittsburgh_G 8601 2,724 1,196 846 1,678 45.79 333 PJM PL_5_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 5.8 7259 83% PJM PJMSD0_3_MSA_Pittsburgh_G 8604 1,700 0 1,492 1,700 44.47 561 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJM PJMSD0_9_MSA_PITSburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJM PJMSD0_9_MSA_PITSburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84% PJMSD0_9_MSA_PITSburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038		D. 11. 15. 15. 15. 15. 15. 15. 15. 15. 15					0.005	=0.00	=		DE00 5 1404 BUILLIAN		4.050	0.540				450			00/
PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.1   7624   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7612   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7612   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   6.9   5782   66%   PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   7.3   72	РЈМ	PJM500_4_MSA_Philadelphia_0	8690	2,383	0	1,675	3,295	52.22	760	PJM	PECO_5_MSA_Philadelphia_L	6966	1,656	2,510	-394	-2,388	55.94	-153	3.7	0	0%
PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.1   7624   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7612   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7612   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   6.9   5782   66%   PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   7.3   72	P.IM	P.IM500 7 MSA York-Hanover	8760	2 696	0	2 071	2 570	52 28	QAS	P.IM	PECO 5 MSA Philadelphia I	6966	1 656	2 510	-304	-2 388	55 94	-153	3.7	1444	16%
PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579_PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   7.8   7616   87%   PJM   AP_1_County_Harrison_G   8760   6,563   2,223   2,676   3,904   44.26   1,038_PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7622   87%   PJM   PJMS00_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579_PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   6.0   7684   66%   78%   PJM   PJMS00_3_MSA_Pittsburgh_G   8601   2,724   1,196   846   1,678   45.79   333_PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   6.0   7684   87%   PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561_PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   7.3   7234   82%   82%   PJM   PL_5_MSA_D_DSIG_G   8601   2,724   1,196   846   1,678   45.79   333_PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   7.3   7234   82%   PJM   PENELEC_2_MSA_D_DSIG_G   8601   2,724   1,196   846   1,678   45.79   333_PJM   PL_5_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   5.8   7359   83%   PJM   PJMS00_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561_PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   6.8   7353   84%   PJM   PJMS00_3_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579_PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   6.8   7353   84%   PJM   PJMS00_3_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579_PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   6.8   7353   84%   PJM   PJMS00_3_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579_PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   6.8   7353   84%   PJMS00_3_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80					0	1.															
PJM   PJMSD0_9_MSA_Pittsburgh_G   8760   6,563   2,223   2,676   3,904   44.26   1,038 PJM   PEPCO_1_MSA_DC_L   8760   0   1,439   -883   -1,547   52.59   -407   8.3   7622   87%				1,700	0								-	1,439	-883		52.59				87%
PJM   PENELEC_2_MSA_DuBois_G   8601   2,724   1,196   846   1,678   45.79   333 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   6.0   7664   87%		AP_1_County_Harrison_G			2,223															7622	87%
PJM   PJM500_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PL_5_MSA_Lancaster_L   8760   0   897   -721   -1,027   51.75   -327   7.3   7234   82%   PJM   PENELEC_2_MSA_DuBois_G   8601   2,724   1,196   846   1,678   45.79   333 PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   5.8   7259   83%   PJM   PJM500_3_MSA_Pittsburgh_G   8760   1,705   0   1,440   1,700   44.47   561 PJM   PJ_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   7.1   8264   94%   PJM   PJM500_9_MSA_Pittsburgh_G   8664   1,700   0   1,492   1,700   44.80   579 PJM   PL_7_MSA_Allentown_L   8760   245   1,051   -695   -1,038   51.57   -314   6.8   7353   84%					0								0								
PJM         PENELEC 2 MSA_DUBois G         8601         2,724         1,196         846         1,678         45.79         333 PJM         PLMSA_Allentown_L         8760         245         1,051         -695         -1,038         51.57         -314         5.8         7259         83%           PJM         PJM500_3_MSA_Pittsburgh_G         8760         1,705         0         1,440         1,700         44.47         561         PJM         PLMSA_Allentown_L         8760         245         1,051         -695         -1,038         51.57         -314         7.1         8264         94%           PJM         PJM500_9_MSA_Pittsburgh_G         8664         1,700         0         1,492         1,700         44.80         579 PJM         PLTMSA_Allentown_L         8760         245         1,051         -695         -1,038         51.57         -314         6.8         7353         84%					1,196								0								
PJM         PJM500_3_MSA_Pittsburgh_G         8760         1,705         0         1,440         1,700         44.47         561         PJM         PL_7_MSA_Allentown_L         8760         245         1,051         -695         -1,038         51.57         -314         7.1         8264         94%           PJM         PJM500_9_MSA_Pittsburgh_G         8664         1,700         0         1,492         1,700         44.80         579         PJM         PL_7_MSA_Allentown_L         8760         245         1,051         -695         -1,038         51.57         -314         6.8         7353         84%					1 196								-								
PJM PJM500_9_MSA_Pittsburgh_G 8664 1,700 0 1,492 1,700 44.80 579 PJM PL_7_MSA_Allentown_L 8760 245 1,051 -695 -1,038 51.57 -314 6.8 7353 84%					1,130																
NYPP NYISO_3_NYC 8760 6,711 2,657 1,899 3,352 48.46 806 PJM PSEG_3_MSA_NewYork_L 8760 1,843 2,275 -969 -2,093 51.97 -441 3.5 8075 92%					0											,					
	NYPP				2,657							8760							3.5		

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion	ndicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86		PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-969	-2,093	51.97	-441	7.1	8154	93%
NYPP	NYISO_6_NYF	7576	4,103	1,983	579	1,680	50.77	223	PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-969	-2,093	51.97	-441	1.2	8146	93%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46	806	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,225	-2,112	52.37	-562	3.9	7743	88%
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86	609	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,225	-2,112	52.37	-562	7.5	8156	93%
NYPP	NYISO 6 NYF	7576	4,103	1.983	579	1,680	50.77	223	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,225	-2,112	52.37	-562	1.6	8181	93%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,899	3,352	48.46		PJM	PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,182	-2,500	51.96	-538	3.5	8005	91%
NYPP	NYISO_1_NYA	8310	4,946	2,500	1,634	2,263	44.86		PJM	PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,182	-2,500	51.96	-538	7.1	8043	92%
NYPP	NYISO_6_NYF	7576	4,103	1,983	579	1,680	50.77	223	PJM	PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,182	-2,500	51.96	-538	1.2	7974	91%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76	508	VACAR	SCEG_9_MSA_Charleston_G	8669	1,152	1,944	-460	-1,230	44.76	-179	1.0	2133	24%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	708	VACAR	SCEG_9_MSA_Charleston_G	8669	1,152	1,944	-460	-1,230	44.76	-179	1.1	2120	24%
VACAR	SCPSA_10_MSA_Charleston_G	8760	1,680	0	1,428	1,680	44.59	558	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	1.5	1653	19%
VACAR	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	336	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	1.2	2121	24%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	708	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	2.4	4349	50%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76	508	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	2.3	4349	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15	1,639	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	1.9	4350	50%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	206	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	1.6	4791	55%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23	1,980	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,520	-3,042	46.09	-614	1.9	983	11%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	12,464	9,217	1,920	5,437	43.71	708	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	2.1	479	5%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	3,574	2,674	582	1,585	44.54	206	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	1.2	720	8%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	2.8	764	9%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L SOCO 10 MSA Albany-	7956	3,431	4,125	-781	-3,110	45.77	-284	4.9	2390	27%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,111	6,381	44.23	1,980	SOUTHERN	Valdosta_L SOCO_10_MSA_Albany-	7956	3,431	4,125	-781	-3,110	45.77	-284	1.5	428	5%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,237	9,393	44.15	1,639	SOUTHERN	Valdosta_L SOCO 10 MSA Albany-	7956	3,431	4,125	-781	-3,110	45.77	-284	1.6	443	5%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	1,092	SOUTHERN	Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	4.6	491	6%
VACAR	DUK_9_MSA_Charlotte_G	8544	14,681	9,966	3,002	5,557	43.40	1,113	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	2.4	629	7%
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33		SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	3,431	4,125	-781	-3,110	45.77	-284	11.4	3124	36%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,325	1,876	43.76			SOCO_10_MSA_Albany-Valdo	7956	3,431	4,125	-781	-3,110	45.77	-284	2.0	489	6%
	TVA_1_MSA_Chatt-Hunts_G TVA_4_MSA_Clarksville_G	8755 8592	17,334 2,544	9,966 150	3,029 2,120	7,429 2,481	41.20 40.90		SOUTHERN SOUTHERN	SOCO_16_MSA_Atlanta_L SOCO_16_MSA_Atlanta_L	8760 8760	694 694	3,058 3,058	-1,372 -1,372	-2,611 -2,611	44.19 44.19	-531 -531	3.0 3.3	91 1580	1% 18%
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,372	-2,611	44.19	-531	9.9	2924	33%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,372	-2,611	44.19	-531	1.2	387	4%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	5,205	4,575	-559	-1,701	42.60	-176	1.7	3196	36%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	1,092	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	5,205	4,575	-559	-1,701	42.60	-176	1.4	2947	34%
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	5,205	4,575	-559	-1,701	42.60	-176	8.3	2961	34%
	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20			SOCO_21_MSA_Atlanta_G	8673	3,334	2,733	-780	-1,570	43.92	-297	2.7	86	1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_21_MSA_Atlanta_G	8673	3,334	2,733	-780	-1,570	43.92	-297	3.0	1959	22%

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub In	formation								Sink Hub Inf	ormation								Congestion	ndicators	
					Average									Average						
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Price Differential	U90 Hours	U90 %
					, ,		,	(ψινιινι)						, ,	. ,	,	( , ,			
	EES_9_MSA_Russellville_G EES_10_MSA_Vicksburg_G	2760 8064	6,123 3,544	4,517 1,249	188 872	1,044 1,212	34.33 42.99	18 302	SOUTHERN SOUTHERN	SOCO_21_MSA_Atlanta_G SOCO_33_MSA_Atlanta_L	8673 8760	3,334 3	2,733 3,305	-780 -1,952	-1,570 -3,314	43.92 44.21	-297 -756	9.6 1.2	2918 547	33% 6%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	1,092	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	44.21	-756	3.0	244	3%
ENTERGY	EES 9 MSA Russellville G	2760	6,123	4,517	188	1,044	34.33	18	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	44.21	-756	9.9	3007	34%
	TVA 4 MSA Clarksville G	8592	2,544	150	2,120	2,481	40.90			SOCO 33 MSA Atlanta L	8760	3	3,305	-1,952	-3,314	44.21	-756	3.3	1733	20%
	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33			SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,960	-3,169	44.31	-761	10.0	3058	35%
ENTERGY I	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,960	-3,169	44.31	-761	1.3	626	7%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	1,092	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,960	-3,169	44.31	-761	3.1	372	4%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_5_GEN_GEPCHY_L SOCO 6 MSA Augusta-	8760	2,098	3,403	-1,960	-3,169	44.31	-761	3.4	1787	20%
	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20		SOUTHERN	Richmond_L	8760	0	1,187	-720	-1,220	44.25	-279	3.0	63	1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_6_MSA_Augusta-Richn SOCO 6 MSA Augusta-	8760	0	1,187	-720	-1,220	44.25	-279	3.4	1400	16%
ENTERGY I	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	SOUTHERN	Richmond_L SOCO 6 MSA Augusta-	8760	0	1,187	-720	-1,220	44.25	-279	9.9	2743	31%
ENTERGY I	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	SOUTHERN	Richmond_L	8760	0	1,187	-720	-1,220	44.25	-279	1.3	337	4%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	17,334	9,966	3,029	7,429	41.20	1,092	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	44.21	-441	3.0	241	3%
ENTERGY I	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	44.21	-441	9.9	3006	34%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,120	2,481	40.90	745	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	44.21	-441	3.3	1717	20%
ENTERGY I	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	872	1,212	42.99	302	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	44.21	-441	1.2	547	6%
	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33			TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,315	-2,941	39.50	-455	5.2	2879	33%
	LGEE_3_GEN_Gehnt2_G EKPC 8 MSA Maysville G	8760 8760	2,000 1,396	225 272	1,554 837	1,900 1.091	36.63 39.94			TVA_3_MSA_Knoxville_L TVA 5 MSA Nashville L	8760 8677	3,684 9,154	5,102 8,858	-1,315 -1,638	-2,941 -5,752	39.50 41.29	-455 -587	2.9 1.4	4983 1244	57% 14%
ENTERGY	EES_9_MSA_Russellville_G	2760	6,123	4,517	188	1,044	34.33	18	TVAUTHOR	TVA_5_MSA_Nashville_L	8677	9,154	8,858	-1,638	-5,752	41.29	-587	7.0	2797	32%
	BREC_3_County_Webster_G	8760	1,355	476	879	1,156	35.98			TVA_5_MSA_Nashville_L	8677	9,154	8,858	-1,638	-5,752	41.29	-587	5.3	6736	77%
	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	36.63			TVA_5_MSA_Nashville_L	8677	9,154	8,858	-1,638	-5,752	41.29	-587	4.7	6183	70%
	AECI_4_GEN_NewMadrid1_G EES 9 MSA Russellville G	8760 2760	2,315 6,123	248 4,517	1,080 188	1,590 1,044	37.65 34.33			TVA_5_MSA_Nashville_L TVA 7 MSA Memphis L	8677 8745	9,154 7,215	8,858 5,982	-1,638 -1,707	-5,752 -4,409	41.29 41.06	-587 -613	3.6 6.7	2591 790	29% 9%
MISO	LGEE 3 GEN Gehnt2 G	8760	2.000	225	1.554	1,900	36.63	499		TVA_7_WSA_Wemphis_L	8745	7,215	5,982	-1,707	-4,409	41.06	-613	4.4	5269	60%
	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47		PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-540	-1,124	49.78	-236	5.3	7756	88%
	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	336	PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-540	-1,124	49.78	-236	4.9	6570	75%
	VAP_7_G	6808	4,179	303	1,699	3,608	48.73		PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-540	-1,124	49.78	-236	1.0	5582	64%
	PJM500_9_MSA_Pittsburgh_G	8664 8760	1,700 6,563	0 000	1,492	1,700 3,904	44.80 44.26	1.038	PJM	VAP_15_MSA_VB-Norfolk_L VAP 15 MSA VB-Norfolk L	8760 8760	435 435	1,297 1,297	-540 -540	-1,124	49.78 49.78	-236 -236	5.0 5.5	7745 7684	88% 87%
	AP_1_County_Harrison_G AEP 8 GEN Amos01 G	8760	19,694	2,223 6.544	2,676 6.079	10.227	44.26	2,159		VAP_15_WSA_VB-NOTIONK_L VAP 15 MSA VB-Norfolk L	8760	435	1,297	-540 -540	-1,124 -1.124	49.78	-236	9.2	8020	91%
	VAP 7 G	6808	4.179	303	1,699	3,608	48.73		PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1.075	51.74	-291	3.0	5537	63%
	VAP 1 MSA Richmond G	8760	10,524	3,579	3,443	6.047	50.33	1,518		VAP 27 MSA DC L	8760	0	1,048	-643	-1.075	51.74	-291	1.4	3050	35%
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159		VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	51.74	-291	11.2	8018	91%
VACAR (	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	336	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	51.74	-291	6.9	7534	86%
PJM /	AP_1_County_Harrison_G	8760	6,563	2,223	2,676	3,904	44.26	1,038	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	51.74	-291	7.5	7671	87%
	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47	561	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	51.74	-291	7.3	7696	88%
	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0 000	1,492	1,700	44.80	579	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	51.74	-291	6.9	7616 7707	87%
	AP_1_County_Harrison_G PJM500 9 MSA Pittsburgh G	8760 8664	6,563 1,700	2,223	2,676 1,492	3,904 1,700	44.26 44.80	1,038	PJM PJM	VAP_33_MSA_DC_L VAP 33 MSA DC L	8760 8760	910 910	2,983 2,983	-1,877 -1,877	-2,931 -2,931	51.79 51.79	-852 -852	7.5 7.0	7707 7772	88% 88%
	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,079	1,700	44.80	2,159		VAP_33_MSA_DC_L VAP 33 MSA DC L	8760	910	2,983	-1,877	-2,931	51.79	-852 -852	11.2	8151	93%
	PJM500 3 MSA Pittsburgh G	8760	1.705	0,044	1.440	1,700	44.47		PJM	VAP 33 MSA DC L	8760	910	2,983	-1,877	-2,931	51.79	-852	7.3	7772	88%
	VAP 1 MSA Richmond G	8760	10,524	3.579	3,443	6.047	50.33	1,518		VAP 33 MSA DC L	8760	910	2,983	-1,877	-2,931	51.79	-852	1.5	3756	5578
	CPLE_1_MSA_Durham_G	7607	10,324	8,563	986	2,572	44.85		PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,877	-2,931	51.79	-852	6.9	7702	
PJM	VAP_7_G	6808	4,179	303	1,699	3,608	48.73	564	PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,877	-2,931	51.79	-852	3.1	5547	
	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,440	1,700	44.47	561	PJM	VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	16.5	7222	
	AP_1_County_Harrison_G	8760	6,563	2,223	2,676	3,904	44.26	1,038		VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	16.7	5725	
	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,443	6,047	50.33	1,518		VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	10.7	5484	
PJM	PJM500_7_MSA_York-Hanover_	8760	2,696	0	2,071	2,570	52.28	948	PJM	VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	8.7	6107	

Task 2: Appendix 4, Corridors Results by Scenario BaseCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation							1	Congestion I	ndicators	
					Average									Average				2 2 . 1g0011011 1		
					net	Max net	Average	Revenue						net		Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price	U90	
Market Area		Hours	Weight	Weight	(MW)		(\$/MWh)		Market Area		Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)		Differential	Hours	U90 %
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,079	10,227	40.55	2,159		VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	20.4	6178	
	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	44.80		PJM	VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	16.2	7260	
	PJM500_4_MSA_Philadelphia_0	8690	2,383	0	1,675	3,295	52.22			VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	8.8	5739	
	PJM500_5_MSA_DC_G	8760	1,730	0	1,600	1,730	52.91			VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	8.1	5131	
VACAR	CPLE_1_MSA_Durham_G	7607	10,224	8,563	986	2,572	44.85	336	PJM	VAP_7_G	1952	4,179	303	-1,013	-2,512	60.98	-121	16.1	5448	
ENTERGY	AFOL A OFN NoviMadelia O	0700	2,315	240	1,080	1,590	37.65	250	SPP	WERE 4 GEN Wolfcreek G	4405	3,510	2.450	450	-1,676	45.24	-92	7.7	7005	
SPP	AECI_4_GEN_NewMadrid1_G KACP 4 MSA KansasCity G	8760 7896	670	248	1,060	1,590	15.76	143		WERE 4 GEN Wolfcreek G	4485 4485	3,510	2,459 2,459	-453 -453	-1,676	45.34 45.34	-92 -92	7.7 29.6	7905 7378	
SPP	KACP_4_MSA_Kansascity_G	7 090	670	U	1,149	1,520	15.76	143	322	WERE_4_GEIN_WOIICIEEK_G	4460	3,510	2,459	-453	-1,070	45.34	-92	29.6	1310	$\longrightarrow$
SPP	AEPW_5_MSA_Tulsa_G	7078	4,226	2,571	392	1,198	36.54	101	SPP	WERE_4_GEN_Wolfcreek_G	4485	3,510	2,459	-453	-1,676	45.34	-92	8.8	4175	
SPP	WERE_1_MSA_Manhattan_G	8641	2,988	409	1,327	2,260	31.79	365	SPP	WERE_4_GEN_Wolfcreek_G	4485	3,510	2,459	-453	-1,676	45.34	-92	13.6	1182	
	NPPD_4_GEN_Gentleman_G	8240	2,702	148	822	1,475	15.41			WERE_4_GEN_Wolfcreek_G	4485		2,459	-453	-1,676	45.34	-92	29.9	8734	
	ALTE_2_MSA_Madison_G	8747	1,665	441	494	1,033	30.31	131	MISO	XEL_3_MSA_Minneapolis_G	5875	7,596	7,622	-947	-2,499	38.26	-213	8.0	2794	
MISO	OTP_9_GEN_BigStone_G	8640	1,189	136	889	1,593	11.43	88	MISO	XEL_3_MSA_Minneapolis_G	5875	7,596	7,622	-947	-2,499	38.26	-213	26.8	8641	
-																				$\longrightarrow$
-																				-
									ĺ	İ										
<u> </u>																				
-																				
-																				
-																	-			
<b>—</b>																				
<b>-</b>										1										+
	l .																			

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub Ir	nformation								Sink Hub Info	ermation								Congestion	Indicators	$\overline{}$
Course ride ii	TOTAL CONTROL OF THE PROPERTY				Average				OHIN TIGO HING	······································				Average				Congodion	maioatoro	
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			l
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price	U90	1
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
MISO MISO	FE_6_MSA_Pittsburgh_G	8592 8643	2,371 2,892	213 1.694	1,964 859	2,290 1,599	49.02 45.04	334		AEP_1_MSA_Lynchburg_G	8760 8760	843 843	2,162 2,162	-1,611 -1,611	-2,415 -2,415	50.19 50.19	-708 -708	1.2 5.1	6619 4070	75% 46%
PJM	NIPS_8_MSA_Chicago_G NI 20 MSA Chicago G	7868	1,632	1,694	859	1,599	45.04 45.22	334		AEP_1_MSA_Lynchburg_G AEP_1_MSA_Lynchburg_G	8760	843 843	2,162	-1,611	-2,415 -2.415	50.19	-708 -708	5.1	4070	46% 47%
	NI 15 MSA Davenport G	8712	2,479	03	1.682	2,314	37.11		PJM	AEP 1 MSA Lynchburg G	8760	843	2,162	-1,611	-2,415	50.19	-708	13.1	4729	54%
	NI_7_MSA_Rochelle_G	8760	2,473	0	2.119	2,314	40.58		PJM	AEP 1 MSA Lynchburg G	8760	843	2,162	-1,611	-2,415	50.19	-708	9.6	5243	60%
	NI 6 MSA Chicago G	7271	9,759	7.577	894	3,023	45.75		PJM	AEP 1 MSA Lynchburg G	8760	843	2,162	-1,611	-2,415	50.19	-708	4.4	4299	49%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3.559	4,074	45.36	1,414	P.IM	AEP_1_MSA_Lynchburg_G	8760	843		-1,611	-2,415	50.19	-708	4.8	4280	49%
MISO	AMRN_12_MSA_StLouis_L	6286	5,059	6,066	623	1,639	36.94			AEP_1_MSA_Lynchburg_G	8760	843		-1,611	-2,415	50.19	-708	13.2	7137	81%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0,000	1,411	1,664	45.86		PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,611	-2,415	50.19	-708	4.3	6892	78%
PJM	NI_6_MSA_Chicago_G	7271	9,759	7,577	894	3,023	45.75	297		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	4.6	1401	16%
MISO	NIPS_8_MSA_Chicago_G	8643	2,892	1,694	859	1,599	45.04	334	PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	5.3	1166	13%
PJM	NI_20_MSA_Chicago_G	7868	1,632	83	887	1,505	45.22	315	PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	5.2	1242	14%
	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	40.58		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	9.8	3386	39%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,559	4,074	45.36	1,414		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	5.0	1386	16%
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	44.67		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	5.7	5053	58%
MISO	AMRN_12_MSA_StLouis_L	6286	5,059	6,066	623	1,639	36.94		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	13.4	6244	71%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,682	2,314	37.11	544		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671	-2,729	50.37	-737	13.3	2778	32%
MISO MISO	IPL_2_MSA_Jasper_G	8760 8592	1,678	213	1,411 1,964	1,664	45.86		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,671 -1,671	-2,729	50.37	-737	4.5 1.4	6210 5365	71% 61%
IVIIOU	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02	627	PJM	AEP_2_STA_TN-WV_L AEP_9_MSA_Canton-	8760	1,284	2,977	-1,0/1	-2,729	50.37	-737	1.4	5365	01%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,559	4,074	45.36	1,414	PJM	Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	-694	5.0	1559	18%
. Jivi	z_wo/\_onloago_G	0700	3,342	1,203	3,338	4,074	40.00	1,414	. JIVI	AEP_9_MSA_Canton-	0700	133	2,120	1,573	۷,۷۵۵	30.37	-034	5.0	1009	10 /6
PJM	NI_6_MSA_Chicago_G	7271	9,759	7,577	894	3,023	45.75	297	PJM	Massillon L	8760	733	2,120	-1,573	-2,255	50.37	-694	4.6	1558	18%
	TT_O_MO/T_OMOAGO_O		-,,,,,,,	.,		-,				AEP_9_MSA_Canton-				.,					1000	1070
PJM	NI 7 MSA Rochelle G	8760	2,290	0	2,119	2,290	40.58	753	PJM	Massillon L	8760	733	2,120	-1,573	-2,255	50.37	-694	9.8	3806	43%
						·				AEP_9_MSA_Canton-										
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,682	2,314	37.11	544	PJM	Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	-694	13.3	3361	38%
										AEP_9_MSA_Canton-										
MISO	NIPS_8_MSA_Chicago_G	8643	2,892	1,694	859	1,599	45.04	334	PJM	Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	-694	5.3	1172	13%
										AEP_9_MSA_Canton-										1
PJM	NI_20_MSA_Chicago_G	7868	1,632	83	887	1,505	45.22	315	PJM	Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	-694	5.1	1557	18%
	IDL O MOA Janes O	0700	4.070			4 004	45.00	507	D.114	AEP_9_MSA_Canton-	0700	700	0.400	4.570	0.055	50.07	00.4	4.5	0.405	700/
MISO	IPL_2_MSA_Jasper_G	8760	1,678	U	1,411	1,664	45.86	567	PJM	Massillon_L AEP 9 MSA Canton-	8760	733	2,120	-1,573	-2,255	50.37	-694	4.5	6405	73%
міѕо	FE 6 MSA Pittsburgh G	8592	2,371	213	1,964	2,290	49.02	827	PJM	Massillon L	8760	733	2,120	-1,573	-2,255	50.37	-694	1.4	4647	53%
WIIGO	TE_0_WO/\_T INSBUIGH_O	0002	2,071	210	1,504	2,230	40.02	021	1 0101	AEP 9 MSA Canton-	0700	700	2,120	1,010	2,200	50.07	004	1.4	1011	3370
PJM	DLCO 7 MSA Pittsburgh G	8232	1,644	25	1,367	1,632	48.83	549	PJM	Massillon L	8760	733	2,120	-1,573	-2,255	50.37	-694	1.5	4750	54%
			,		, , , , ,	,				AEP_9_MSA_Canton-				- 1	, ,					
MISO	AMRN_12_MSA_StLouis_L	6286	5,059	6,066	623	1,639	36.94	145	PJM	Massillon_L	8760	733	2,120	-1,573	-2,255	50.37	-694	13.4	6519	74%
PJM	NI_20_MSA_Chicago_G	7868	1,632	83	887	1,505	45.22	315	MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	9.5	951	11%
	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	3.0	1276	15%
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,559	4,074	45.36	1,414	MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	9.4	1265	14%
MAPP	MEC 3 MSA DesMoines G	8371	3.307	1.933	588	1.348	26.64	131	MISO	AMRN 12 MSA StLouis L	2474	5.059	6.066	-438	-1.792	54.73	-59	28.1	2364	27%
PJM	NI 15 MSA Davenport G	8712	2,479	0,000	1,682	2,314	37.11		MISO	AMRN 12 MSA StLouis L	2474	5,059	6,066	-438	-1,792	54.73	-59	17.6	2572	29%
PJM	NI 7 MSA Rochelle G	8760	2,290	0	2,119	2,290	40.58		MISO	AMRN 12 MSA StLouis L	2474	5,059	6,066	-438	-1,792	54.73	-59	14.2	3556	40%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,511	3,387	45.87	1,009	MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	8.9	6183	70%
MISO	IP_7_GEN_Baldwin_G	8760	1,900	444	1,149	1,478	40.47		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	14.3	0	0%
MISO	IP_8_GEN_Clinton_G	7994	2,302	1,195	924	1,212	43.68		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	11.1	446	5%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	4.3	64	1%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,095	1,597	47.78		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	6.9	2961	34%
PJM	NI_6_MSA_Chicago_G	7271	9,759	7,577	894	3,023	45.75		MISO	AMRN_12_MSA_StLouis_L	2474	5,059	6,066	-438	-1,792	54.73	-59	9.0	1277	15%
PJM	NI_15_MSA_Davenport_G	8712 8760	2,479	0	1,682	2,314	37.11 40.58		MISO	AMRN_2_County_Macon_L	8760	174 174	1,209	-720	-1,156 -1,156	45.09 45.09	-284	8.0	4183 4638	48%
PJM MISO	NI_7_MSA_Rochelle_G IP 7 GEN Baldwin G	8760 8760	2,290 1.900	444	2,119 1,149	2,290 1,478	40.58	753 407	MISO MISO	AMRN_2_County_Macon_L AMRN 2 County Macon L	8760 8760	174	1,209 1,209	-720 -720	-1,156 -1,156	45.09 45.09	-284 -284	4.5 4.6	4638 4366	53% 50%
MISO	AMRN 12 MSA StLouis L	6286	5,059	6,066	1,149	1,478	36.94	145		AMRN_2_County_Macon_L AMRN 2 County Macon L	8760	174	1,209	-720 -720	-1,156	45.09 45.09	-284 -284	4.b 8.1	4366	50% 47%
MISO	IP 8 GEN Clinton G	7994	2,302	1,195	924	1,039	43.68	323	MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	45.09	-284	1.4	222	3%
MAPP	MEC 3 MSA DesMoines G	8371	3,307	1,933	588	1,348	26.64		MISO	AMRN 2 County Macon L	8760	174	1,209	-720	-1,156	45.09	-284	18.4	4402	50%
MISO	FE 9 MSA Weirton G	8760	1,860	112	1,410	1,803	49.49		PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,039	-1,618	52.94	-482	3.4	5077	58%
	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02			AP_2_GEN_Albright3_L	8760	603		-1,039	-1,618	52.94	-482	3.9	4980	57%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593	PJM	AP_2_GEN_Albright3_L	8760	603	1,748	-1,039	-1,618	52.94	-482	2.5	6277	71%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83	549		AP_2_GEN_Albright3_L	8760	603	1,748	-1,039	-1,618	52.94	-482	4.1	5086	58%
										AP_7_MSA_Hagerstown-										1
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,430	1,700	56.53	708	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	11.8	7629	87%
		]			l					AP_7_MSA_Hagerstown-	I					ΙΤ				i
PJM	VAP_7_G	6600	4,179	303	1,771	3,623	64.38	752	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	3.9	5104	58%
D IM	VAR 1 MCA Bi-L	0700	10 504	0.570	2540	0.004	00.00	2.040	D IM	AP_7_MSA_Hagerstown-	0700	200	4 450		4 404	C0 22	44.4	2.0	4500	F00/
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048	FJIVI	Martinsburg_L  AB 7 MSA Hagaretown	8760	203	1,153	-686	-1,101	68.30	-411	2.3	4599	52%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	726	PJM	AP_7_MSA_Hagerstown- Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	11.2	7611	87%
UIVI	r JIVIJUU_9_IVIJA_PIIISDUIGN_G	0004	1,700	U	1,490	1,700	37.05	130	i Jivi	maranovury_L	0100	203	1,103	-000	-1,101	00.30	-411	11.2	רוס/.	6/%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion	Indicators	
					Average									Average						
				l	net	Max net	Average	Revenue						net	Max net	Average	Revenue			1
Mades Assa	Link Name	Source	Gen	Load	injection	injection	Price	surplus	Maniert Area	Link Norma	Sink	Gen	Load	injection	injection	Price	surplus	Price	U90	1100.0/
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name AP_7_MSA_Hagerstown-	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02	827	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	19.3	8182	93%
			,		, , , , ,					AP_7_MSA_Hagerstown-					,					
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83	549	PJM	Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	19.5	8199	93%
										AP_7_MSA_Hagerstown-										
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,674	3,962	56.52	1,324		Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	11.8	7553	86%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593	РЈМ	AP_7_MSA_Hagerstown-Martin	8760	203	1,153	-686	-1,101	68.30	-411	17.9	8324	95%
MISO	FE 9 MSA Weirton G	8760	1,860	112	1,410	1,803	49.49	611	PJM	AP_7_MSA_Hagerstown- Martinsburg_L	8760	203	1,153	-686	-1,101	68.30	-411	18.8	8196	93%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048		AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	3.1	3836	44%
PJM	PJM500 9 MSA Pittsburgh G	8664	1,700	0,070	1,490	1,700	57.05		PJM	AP 8 MSA DC-VA-MD L	8760	0	1.097	-728	-1,048	69.06	-441	12.0	7699	88%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,430	1,700	56.53		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	12.5	7675	87%
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,410	1,803	49.49	611	PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	19.6	8216	94%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25		1,632	48.83		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	20.2	8216	94%
PJM	VAP_7_G	6600	4,179	303	1,771	3,623	64.38		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	4.7	5382	61%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	69.06	-441	18.6	8020	91%
PJM MISO	AP_1_County_Harrison_G FE 6 MSA Pittsburgh G	8760 8592	6,563 2,371	2,223 213	2,674 1,964	3,962 2,290	56.52 49.02	1,324	PJM PJM	AP_8_MSA_DC-VA-MD_L AP_8_MSA_DC-VA-MD_L	8760 8760	0	1,097 1,097	-728 -728	-1,048 -1,048	69.06 69.06	-441 -441	12.5 20.0	7599 8198	87% 93%
WIIGO	I L_0_W3A_FIIISDUIYII_G	0092	2,011	213	1,304	2,290	43.02	021	I UIVI	BGE_10_MSA_Baltimore-	0,00	-	1,097	-120	-1,040	03.00	-441	20.0	0198	93%
PJM	PJM500 9 MSA Pittsburgh G	8664	1,700	0	1,490	1,700	57.05	736	PJM	Towson L	8760	845	1,565	-475	-1,030	70.57	-294	13.5	7641	87%
			.,. 50	l – ř	.,.50	1,1.50	250	. 50		BGE_10_MSA_Baltimore-	2.50	2.10	.,230	0	.,,,,,					0.70
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,430	1,700	56.53	708	PJM	Towson_L	8760	845	1,565	-475	-1,030	70.57	-294	14.0	7700	88%
										BGE_5_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,430	1,700	56.53	708	PJM	Towson_L	8760	263	1,462	-718	-1,436	70.39	-443	13.9	7696	88%
										BGE_5_MSA_Baltimore-										
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	736	PJM	Towson_L	8760	263	1,462	-718	-1,436	70.39	-443	13.3	7634	87%
PJM	DIMEGO 2 MCA Bittabarah C	0700	4 705		4 400	4 700	50.50	700	PJM	BGE_9_MSA_Baltimore-	8760	_	4.400	000	4 004	74.00	-429	44.5	7744	88%
PJIVI	PJM500_3_MSA_Pittsburgh_G	8760	1,705	U	1,430	1,700	56.53	708	PJIVI	Towson_L BGE_9_MSA_Baltimore-	8760	U	1,186	-690	-1,231	71.02	-429	14.5	7711	88%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	736	PJM	Towson_L	8760	0	1.186	-690	-1,231	71.02	-429	14.0	7670	87%
MISO	NIPS_8_MSA_Chicago_G	8643	2,892	1,694	859	1,599	45.04		MISO	CIN 1 MSA Indianapolis L	8760	816	4,274	-2,273	-3,693	47.39	-943	2.3	524	6%
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	44.67		MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,693	47.39	-943	2.7	4959	56%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,511	3,387	45.87	1,009	MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,693	47.39	-943	1.5	2912	33%
MISO	AMRN_12_MSA_StLouis_L	6286	5,059	6,066	623	1,639	36.94		MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,693	47.39	-943	10.4	3394	39%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	0	1,411	1,664	45.86		MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,273	-3,693	47.39	-943	1.5	2711	31%
MISO MISO	NIPS_8_MSA_Chicago_G	8643	2,892	1,694	859	1,599	45.04		MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-883	-1,480	46.48	-360	1.4	502	6%
VACAR	LGEE_3_GEN_Gehnt2_G SCEG_1_MSA_Columbia_G	8760 7998	2,000 4,954	225 2,752	1,554 999	1,900 2,547	44.67 56.98	455	MISO VACAR	CIN_7_MSA_Lafayette_L CPLE_1_MSA_Durham_G	8760 830	10,224	1,712 8,563	-883 -383	-1,480 -1,448	46.48 67.04	-360 -21	1.8 10.1	5772 2292	66% 26%
PJM	VAP_7_G	6600	4,179	303	1,771	3,623	64.38	752		CPLE 1 MSA Durham G	830	10,224	8,563	-383	-1,448	67.04	-21		4936	56%
VACAR	SCPSA 10 MSA Charleston G	8760	1,680	0	1,437	1,680	56.12	706		CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	-21		1324	15%
VACAR	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	3,071	5,821	54.45	1,429		CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	-21		555	6%
VACAR	DUK_5_MSA_Seneca_G	6330	1,911	0	1,074	1,911	62.14	422		CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	-21	4.9	4626	53%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048		CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	-21		563	6%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593	VACAR	CPLE_1_MSA_Durham_G	830	10,224	8,563	-383	-1,448	67.04	-21	16.6	6778	77%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		DUK_4_MSA_Greenville_L	6832	3,546	4,489	-609	-2,063	54.71	-228	4.3	4035	46%
PJM VACAR	AEP_8_GEN_Amos01_G SCEG 1 MSA Columbia G	8760 7998	19,694 4,954	6,544 2,752	5,868 999	10,212 2,547	50.44 56.98	2,593 455		DUK_8_MSA_Charlotte_L DUK 9 MSA Charlotte G	8760 211	1,407 14,681	4,886 9,966	-2,150 -503	-3,877 -2,175	55.28 90.83	-1,041 -10	4.8 33.9	3772 181	43% 2%
	SOCO 32 MSA Pascagoula G	7998	3,574	2,752	499	1,541	56.69	212		DUK_9_MSA_Charlotte_G  DUK 9 MSA Charlotte G	211	14,681	9,966	-503	-2,175	90.83	-10	34.1	2560	29%
	SOCO_32_MSA_r ascagotia_G SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	35.5	802	9%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00		VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	35.8	2756	31%
	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483	VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	35.4	527	6%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	5,205	4,575	224	1,452	60.78		VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	30.1	2781	32%
	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02			DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	35.8	2712	31%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	40.4	3971	45%
VACAR	CPLE_1_MSA_Durham_G	7930	10,224	8,563	1,125	2,523	57.05	509		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-503	-2,175	90.83	-10	33.8	290	3%
VACAR SPP	DUK_5_MSA_Seneca_G AEPW_5_MSA_Tulsa_G	6330 7582	1,911 4,226	2,571	1,074 425	1,911 1,275	62.14 48.49		VACAR ENTERGY	DUK_9_MSA_Charlotte_G EES_1_MSA_Jackson_L	211 8760	14,681 3,218	9,966 3,066	-503 -1,418	-2,175 -2,066	90.83 54.26	-10 -674	28.7 5.8	34 3124	0% 36%
SPP	AEPW_9_MSA_MountPleasant_	8404	8,168	3,832	852	2,045	52.70		ENTERGY	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,418	-2,066	54.26	-674	1.6	8741	100%
		3.04	5,.00	5,502	302	2,540	32.70	3//			0.00	3,210	5,500	.,.10	2,000	020	5/4	1.0	3.41	.5576
ENTERGY	EES_4_GEN_Ouachita_G	6519	6,345	2,417	1,268	3,688	58.18	481	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	3.5	6455	73%
	·									_										
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,347	1,728	55.08	650	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.6	6450	73%
										=== = 1101 1: -:										l
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	850	1,211	55.21	378	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.4	6495	74%
SOLITHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.4	7072	81%
SOUTHERN	5000_51_W5A_Allanta_G	8/80	11,705	1,563	4,179	9,751	55.29	2,024	ENTERGY	LLO_0_WIGH_INEWOTIERIS_G	8760	9,735	9,294	-2,906	-5,564	01.04	-1,007	0.4	7072	01%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00	672	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.6	7017	80%
	0_E0o. (_Diffiningfiditi_G	5.50	2,000	.,,,,,,,	.,,,,,,,,	.,,,,,,,,					0.00	0,.00	5,257	_,000	5,004	31.34	.,001	0.0	7017	

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub Ir	nformation								Sink Hub Info	rmation								Congestion	Indicators	$\overline{}$
					Average	May not	Average	Royanya						Average	May not	Averege	Payanua			
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
ENTERGY	EES_8_MSA_BatonRouge_G	8496	1,060	0	1,059	1,060	54.99	405	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.7	5423	62%
ENTERGY	EES_8_MSA_Batorikouge_G	8496	1,060	U	1,059	1,060	54.99	495	ENTERGI	EE5_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,900	-5,564	61.64	-1,001	0.7	5423	62%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.6	7041	80%
COLITUEDN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	0.400	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	6.2	7101	81%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	0,802	U	5,110	0,381	55.47	2,483	ENTERGT	EES_5_WISA_NewOrleans_G	8760	9,735	9,294	-2,900	-5,564	61.64	-1,001	6.2	7101	81%
SPP	AEPW_5_MSA_Tulsa_G	7582	4,226	2,571	425	1,275	48.49	156	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	13.2	6883	78%
SPP	AEPW 9 MSA MountPleasant	8404	8.168	3.832	852	2.045	52.70	277	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9.735	9.294	-2.966	-5,564	61.64	-1.601	8.9	8733	99%
SFF	AEFW_9_W3A_W0UII(Fleasaii(_	0404	0,100	3,032	002	2,040	32.70	311	ENTERGI	EES_5_WISA_NewOffeatis_G	8760	9,733	9,294	-2,900	-5,564	01.04	-1,001	0.9	0/33	9976
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674	499	1,541	56.69	212	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,966	-5,564	61.64	-1,601	5.0	6704	76%
SPP	AEPW_5_MSA_Tulsa_G	7582	4.226	2.571	425	1.275	48.49	156	ENTERGY	EES_7_MSA_Beaumont- PortArthur G	7005	7.393	4.949	-545	-1.645	55.69	-213	7.2	4350	50%
SFF	AEFW_5_WSA_Tuisa_G	7302	4,220	2,371	423	1,273	40.49	100	ENTERGI	EES 7 MSA Beaumont-	7003	7,393	4,949	-545	-1,043	55.69	-213	1.2	4330	30%
SPP	AEPW_9_MSA_MountPleasant_	8404	8,168	3,832	852	2,045	52.70		ENTERGY	PortArthur_G	7005	7,393	4,949	-545	-1,645	55.69	-213	3.0	8735	99%
ENTERGY TVAUTHOR	LAGN_1_MSA_BatonRouge_G TVA_4_MSA_Clarksville_G	8760 8592	2,199 2,544	163 150	1,347 2,121	1,728 2,481	55.08 51.78	650 944		EES_9_MSA_Russellville_G EES 9 MSA Russellville G	6267 6267	6,123 6.123	4,517 4,517	-451 -451	-2,048 -2,048	57.38 57.38	-162 -162	2.3 5.6	2 3657	0% 42%
TVAUTHOR	TVA_4_MSA_Clarksville_G TVA_1_MSA_Chatt-Hunts_G	8754	17.334	9.966	2,121	7,160	52.39	1.366		EES 9 MSA Russellville G	6267	6,123	4,517	-451	-2,048	57.38	-162	5.0	2108	24%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	850	1,211	55.21	378		EES 9 MSA Russellville G	6267	6,123	4,517	-451	-2,048	57.38	-162	2.2	0	0%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	ENTERGY	EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	2.1	1536	17%
	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483		EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	1.9	2012	23%
SPP	AEPW_9_MSA_MountPleasant_	8404	8,168	3,832	852	2,045	52.70	377		EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	4.7	8740	99%
	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788		EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	2.4	1582	18%
ENTERGY SPP	EES_2_MSA_Batesville_G	8743 7582	3,525 4,226	1,697 2,571	1,923 425	2,737 1,275	51.76 48.49	870 156		EES_9_MSA_Russellville_G EES_9_MSA_Russellville_G	6267 6267	6,123 6,123	4,517 4,517	-451 -451	-2,048 -2,048	57.38 57.38	-162 -162	5.6 8.9	1825	21% 3%
ENTERGY	AEPW_5_MSA_Tulsa_G AECI 4 GEN NewMadrid1 G	8760	2,315	2,371	1,095	1,597	47.78	458		EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	9.6	260 3914	45%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00		ENTERGY	EES_9_MSA_Russellville_G	6267	6,123	4,517	-451	-2,048	57.38	-162	2.4	2119	24%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83		MISO	FE_4_MSA_Akron_L	8760	531	2,277	-1,214	-1,778	50.24	-534	1.4	4202	48%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02	827	MISO	FE_4_MSA_Akron_L	8760	531	2,277	-1,214	-1,778	50.24	-534	1.2	4085	47%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02		MISO	FE_5_MSA_Cleveland_L	7570	3,216	4,680	-537	-2,443	51.93	-211	2.9	4694	53%
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,410	1,803	49.49		MISO	FE_5_MSA_Cleveland_L	7570	3,216	4,680	-537	-2,443	51.93	-211	2.4	2462	28%
PJM PJM	AEP_8_GEN_Amos01_G DLCO_7_MSA_Pittsburgh_G	8760 8232	19,694 1,644	6,544 25	5,868 1,367	10,212 1,632	50.44 48.83	2,593	MISO	FE_5_MSA_Cleveland_L FE 5 MSA Cleveland L	7570 7570	3,216 3,216	4,680 4,680	-537 -537	-2,443 -2,443	51.93 51.93	-211 -211	1.5 3.1	4094 4795	47% 55%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2.290	49.02	827		FE 7 MSA Toledo L	8710	2.586	2,106	-717	-1.342	51.37	-321	2.3	6382	73%
MISO	FE 9 MSA Weirton G	8760	1.860	112	1,410	1,803	49.49		MISO	FE 7 MSA Toledo L	8710	2,586	2,106	-717	-1.342	51.37	-321	1.9	5376	61%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83	549	MISO	FE_7_MSA_Toledo_L	8710	2,586	2,106	-717	-1,342	51.37	-321	2.5	6449	73%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	48.83	549		FE_8_MSA_Youngstown_L	8760	939	2,217	-904	-1,569	49.85	-395	1.0	107	1%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674	499	1,541	56.69		FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,013	-3,788	64.34	-1,134	7.7	5088	58%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,013	-3,788	64.34	-1,134	9.0	4973	57%
SOUTHERN	SOCO_28_MSA_Birmingham_G SOCO 17 MSA Mobile G	8760 1894	2,535 5,205	1,090 4.575	1,394 224	1,959 1,452	55.00 60.78	672 26	FRCC FRCC	FPC_3_MSA_Orlando_L FPC 3 MSA Orlando L	8760 8760	1,232 1,232	3,649 3,649	-2,013 -2,013	-3,788 -3,788	64.34 64.34	-1,134 -1,134	9.3 3.6	4975 5043	57% 57%
SOUTHERN	SOCO_17_WSA_Wobile_G SOCO 15 MSA Birmingham G	8507	12,464	9,217	1,684	5,534	55.02	788	FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,013	-3,788	64.34	-1,134	9.3	4976	57%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0,=	5,110	6,381	55.47	2,483	FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,013	-3,788	64.34	-1,134	8.9	4964	57%
SOUTHERN		8760	6,802	0	5,110	6,381	55.47	2,483		FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,543	-2,611	65.12	-880	9.7	5363	61%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674	499	1,541	56.69	212		FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,543	-2,611	65.12	-880	8.4	5439	62%
	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00	672		FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,543	-2,611	65.12	-880	10.1	5368	61%
	SOCO_17_MSA_Mobile_G	1894 8507	5,205	4,575 9,217	224	1,452 5,534	60.78 55.02	26	FRCC	FPC_4_MSA_Tampa_L	8760 8760	2,239	2,873 2,873	-1,543 -1,543	-2,611 -2,611	65.12 65.12	-880	4.3 10.1	5405 5368	62% 61%
FRCC	SOCO_15_MSA_Birmingham_G OUC 1 MSA Orlando G	8688	12,464 889	9,217	1,684 1,109	1,487	63.86	788 615		FPC_4_MSA_Tampa_L FPC_4_MSA_Tampa_L	8760 8760	2,239 2,239	2,873	-1,543 -1,543	-2,611 -2,611	65.12	-880 -880	10.1	4809	55%
	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024		FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,543	-2,611	65.12	-880	9.8	5369	61%
	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483	FRCC	FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	10.9	5615	64%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	5,205	4,575	224	1,452	60.78			FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	5.6	5660	64%
FRCC	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,373	1,584	64.20	753		FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	2.2	5162	59%
FRCC	JEA_6_MSA_Jacksonville_G	8760	1,665	358	872	1,331	65.21	498		FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	1.1	4109	47%
FRCC SOUTHERN	SEC_6_MSA_Palatka_G SOCO 28 MSA Birmingham G	8760 8760	1,330 2,535	1.090	1,135 1,394	1,330 1,959	64.73 55.00	643 672		FPL_2_MSA_FortMyers_G FPL_2_MSA_FortMyers_G	8709 8709	5,929 5,929	4,563 4,563	-1,306 -1.306	-2,761 -2,761	66.36 66.36	-755 -755	1.6 11.4	4137 5616	47% 64%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	11.765	1,583	4,179	9.751	55.29	2.024		FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	11.4	5615	64%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674	499	1,541	56.69		FRCC	FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	9.7	5680	65%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788	FRCC	FPL_2_MSA_FortMyers_G	8709	5,929	4,563	-1,306	-2,761	66.36	-755	11.3	5618	64%
FRCC	SEC_6_MSA_Palatka_G	8760	1,330	0	1,135	1,330	64.73		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	2.5	4877	56%
FRCC	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,373	1,584	64.20		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	3.0	5257	60%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674 1,583	499 4.179	1,541 9,751	56.69		FRCC FRCC	FPL_3_MSA_Miami_L FPL_3_MSA_Miami_L	8760	6,944 6,944	7,089	-2,193 -2,193	-4,333	67.19	-1,291	10.5 11.9	5614	64%
SOUTHERN	SOCO_31_MSA_Atlanta_G SOCO 28 MSA Birmingham G	8760 8760	11,765 2,535	1,583	1,394	1,959	55.29 55.00	2,024 672	FRCC	FPL_3_MSA_MIAMI_L FPL 3 MSA Miami L	8760 8760	6,944	7,089 7,089	-2,193 -2,193	-4,333 -4,333	67.19 67.19	-1,291 -1,291	11.9	5552 5552	63% 63%
SOUTHERN	SOCO 26 MSA Macon G	8760	6.802	1,030	5,110	6.381	55.47	2.483		FPL 3 MSA Miami L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	11.7	5550	63%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	12.2	5553	63%
FRCC	FPC_10_MSA_Lakeland_G	8320	3,561	747	721	1,471	65.71		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	1.5	4261	49%
FRCC	JEA_6_MSA_Jacksonville_G	8760	1,665	358	872	1,331	65.21	498	FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	2.0	3650	42%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub Ir	nformation								Sink Hub Info	rmation							1	Congestion	Indicators	$\overline{}$
					Average									Average						
		0	0	1 1	net	Max net	Average	Revenue			0:.1	0	1 1	net	Max net	Average	Revenue	D.C.	1100	
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
	FPL 8 MSA PortStLucie G	8628	10.364	4,623	1,804	5,105	66.17	1,030		FPL_3_MSA_Miami_L	8760	6.944	7,089	-2,193	-4.333	67.19	-1,291	1.0	3155	36%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	5,205	4,575	224	1,452	60.78		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,193	-4,333	67.19	-1,291	6.4	5597	64%
	FPC_2_MSA_HomosassaSpring	8544	1,584	0	1,373	1,584	64.20			FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	3.0	5309	60%
	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02			FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	12.2		64%
	FPL_8_MSA_PortStLucie_G FPC 10 MSA Lakeland G	8628 8320	10,364 3,561	4,623 747	1,804 721	5,105 1,471	66.17 65.71			FPL_7_MSA_Miami_L FPL 7 MSA Miami L	8760 8760	570 570	3,923 3,923	-2,632 -2,632	-4,256 -4,256	67.17 67.17	-1,549 -1,549	1.0	3169 4371	36% 50%
	JEA 6 MSA Jacksonville G	8760	1,665	358	872	1,331	65.21	498	FRCC	FPL 7 MSA Miami L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	2.0	3779	43%
FRCC	SEC_6_MSA_Palatka_G	8760	1,330	0	1,135	1,330	64.73	643	FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	2.4	4980	57%
	SOCO_17_MSA_Mobile_G	1894	5,205	4,575	224	1,452	60.78			FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	6.4	5621	64%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483		FPL_7_MSA_Miami_L	8760	570	3,923	-2,632	-4,256	67.17	-1,549	11.7	5576	63%
SOUTHERN SOUTHERN	SOCO_28_MSA_Birmingham_G SOCO 31 MSA Atlanta G	8760 8760	2,535 11,765	1,090 1,583	1,394 4,179	1,959 9,751	55.00 55.29	672 2,024	FRCC	FPL_7_MSA_Miami_L FPL 7 MSA Miami L	8760 8760	570 570	3,923 3,923	-2,632 -2,632	-4,256 -4,256	67.17 67.17	-1,549 -1,549	12.2 11.9	5575 5575	63% 63%
SOUTHERN	SOCO_31_MSA_Atlanta_G SOCO 32 MSA Pascagoula G	7473	3,574	2,674	4,179	1,541	56.69		FRCC	FPL_7_MSA_MIAMI_L FPL 7 MSA Miami L	8760	570	3,923	-2,632	-4,256 -4,256	67.17	-1,549	10.5	5635	64%
MISO	XEL_3_MSA_Minneapolis_G	2891	7.596	7.622	612	1,771	18.39		MISO	GRE 4 MSA Minneapolis L	8760	331	1,111	-1.099	-2.124	39.95	-385	21.6	4	0%
MISO	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,234	1,928	52.63	568	ONTARIO	IESO_11_G	8760	9,529	12,779	-3,043	-7,371	56.86	-1,515	4.2	7837	89%
MISO	ITC_7_MSA_Monroe_G	8472	1,500	0	1,344	1,500	51.90		ONTARIO	IESO_11_G	8760	9,529	12,779	-3,043	-7,371	56.86	-1,515	5.0	5778	66%
	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,234	1,928	52.63		ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	56.62	-1,171	4.0	7395	84%
MISO MISO	ITC_7_MSA_Monroe_G ITC_7_MSA_Monroe_G	8472 8472	1,500 1,500	0	1,344 1,344	1,500 1,500	51.90 51.90		ONTARIO ONTARIO	IESO_15_G IESO 2 G	8760 6935	1,964 2,437	3,375 2,116	-2,360 -635	-3,239 -1,375	56.62 52.91	-1,171 -233	4.7 1.0	5707 7620	65% 87%
MISO	ITC 7 MSA Monroe G	8472	1,500	0	1,344	1,500	51.90		ONTARIO	IESO 3 L	8760	2,437	1,696	-1,181	-1,375	55.43	-233 -574	3.5	8038	92%
MISO	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,234	1,928	52.63		ONTARIO	IESO_3_L	8760	39	1,696	-1,181	-1,636	55.43	-574	2.8	7520	86%
	IPL_2_MSA_Jasper_G	8760	1,678	0	1,411	1,664	45.86	567	MISO	IPL_5_MSA_Indianapolis_L	8760	306	1,187	-784	-1,258	47.74	-328	1.9	2435	28%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,511	3,387	45.87	1,009		IPL_5_MSA_Indianapolis_L	8760	306	1,187	-784	-1,258	47.74	-328	1.9	6102	69%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,511	3,387	45.87	1,009		IPL_8_MSA_Indianapolis_L	8760	547	1,227	-528	-1,094	47.81	-221	1.9	6136	70%
MISO MISO	IPL_2_MSA_Jasper_G FE 9 MSA Weirton G	8760 8760	1,678 1,860	112	1,411 1,410	1,664 1,803	45.86 49.49		MISO MISO	IPL_8_MSA_Indianapolis_L ITC_2_MSA_Detroit_L	8760 8624	547 4.001	1,227 5,247	-528 -1,113	-1,094 -3,583	47.81 52.70	-221 -506	2.0 3.2	2471 6691	28% 76%
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02		MISO	ITC_2_MSA_Detroit_L	8624	4,001	5,247	-1,113	-3,583	52.70	-506	3.7	7278	83%
	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	49.02		MISO	ITC_9_MSA_Detroit_L	8760	1,340	4,751	-2,178	-4,518	52.48	-1,001	3.5	7896	90%
MISO	FE_9_MSA_Weirton_G	8760	1,860	112	1,410	1,803	49.49	611	MISO	ITC_9_MSA_Detroit_L	8760	1,340	4,751	-2,178	-4,518	52.48	-1,001	3.0	7535	86%
																				ıl
SPP MISO	WERE_1_MSA_Manhattan_G BREC_3_County_Webster_G	8684 8760	2,988 1,355	409 476	1,338 891	2,255 1,191	39.48 41.70	459	MISO	KACP_7_MSA_KansasCity_L LGEE 5 MSA Lexington L	8760 8760	595	1,291 2.345	-730 -1.778	-1,422 -2,923	45.88 45.68	-293 -712	6.4 4.0	757 3283	9% 37%
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	44.67		MISO	LGEE 5 MSA Lexington L	8760	595	2,345	-1,778	-2,923	45.68	-712	1.0	4322	49%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,394	40.89		MISO	METC_8_MSA_BayCity_G	8173	3,795	2,562	-603	-1,641	53.22	-262	12.3	5315	61%
MISO	ITC_7_MSA_Monroe_G	8472	1,500	0	1,344	1,500	51.90	591	MISO	METC_8_MSA_BayCity_G	8173	3,795	2,562	-603	-1,641	53.22	-262	1.3	3286	37%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		METC_8_MSA_BayCity_G	8173	3,795	2,562	-603	-1,641	53.22	-262	2.8		39%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593	MISO	METC_9_MSA_Kalamazoo_L	8760	118	1,334	-808	-1,473	52.62	-372	2.2	1541	18%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,394	40.89	320	MISO	METC 9 MSA Kalamazoo L	8760	118	1,334	-808	-1,473	52.62	-372	11.7	4823	55%
NEPOOL	NEPOOL 3 ME	3787	3,494	2,522	344	1,072	67.04			NEPOOL 10 RI	6427	2,062	2,203	-313	-1,073	70.36	-142	3.3	7160	82%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,926	2,870	65.56	1,106	NEPOOL	NEPOOL_10_RI	6427	2,062	2,203	-313	-1,073	70.36	-142	4.8	8760	100%
NYPP	NYISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80	791	NEPOOL	NEPOOL_10_RI	6427	2,062	2,203	-313	-1,073	70.36	-142	12.6	5832	66%
NEPOOL	NEPOOL_2_NH	8425	4,204	2,621	1,000	1,918	68.48	577	NEPOOL	NEPOOL_10_RI	6427	2,062	2,203	-313	-1,073	70.36	-142	1.9	7181	82%
NYPP NYPP	NYISO_1_NYA NYISO 3 NYC	8292 8760	4,946 6,711	2,500 2,657	1,651 1,926	2,452 2,870	57.80 65.56	791 1,106		NEPOOL_3_ME NEPOOL 4 NEBOS	4973 8715	3,494 3,262	2,522 5,904	-232 -1,340	-1,137 -3,500	62.13 71.29	-72 -833	4.3 5.7	5832 8760	66% 100%
NYPP	NYISO 1 NYA	8292	4,946	2,500	1,651	2,452	57.80	791	NEPOOL	NEPOOL 4 NEBOS	8715	3,262	5,904	-1,340	-3,500	71.29	-833	13.5	5832	66%
	NEPOOL_3_ME	3787	3,494	2,522	344	1,072	67.04	87		NEPOOL_4_NEBOS	8715	3,262	5,904	-1,340	-3,500	71.29	-833	4.2	7176	82%
	NEPOOL_2_NH	8425	4,204	2,621	1,000	1,918	68.48	577		NEPOOL_4_NEBOS	8715	3,262	5,904	-1,340	-3,500	71.29	-833	2.8	7182	82%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,926	2,870	65.56	1,106		NEPOOL_6_WCMA	8644	4,285	3,417	-1,170	-3,529	71.38	-722	5.8	8612	98%
	NYISO_1_NYA NEPOOL 3 ME	8292 3787	4,946 3,494	2,500 2,522	1,651 344	2,452 1,072	57.80 67.04			NEPOOL_6_WCMA NEPOOL 6 WCMA	8644 8644	4,285 4,285	3,417 3,417	-1,170 -1,170	-3,529 -3,529	71.38 71.38	-722 -722	13.6 4.3	5836 7245	66% 82%
	NEPOOL_3_ME NEPOOL 2 NH	8425	4,204	2,621	1.000	1,918	68.48	577		NEPOOL_6_WCMA	8644	4,285	3,417	-1,170	-3,529	71.38	-722	2.9	7245	83%
	NEPOOL_5_SEMA	8739	6,454	3,978	1,588	3,670	71.41	991	NEPOOL	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	-53	11.0	2199	25%
NEPOOL	NEPOOL 2 NH	8425	4,204	2,621	1,000	1,918	68.48	577	NEPOOL	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	-53	13.9	7798	89%
NEPOOL	NEPOOL_8_SWCT	6228	2,678	1,850	421	1,723	78.27	205	NEPOOL	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	-53	4.1	7476	85%
NYPP NYPP	NYISO_1_NYA NYISO 3 NYC	8292 8760	4,946 6,711	2,500 2,657	1,651 1,926	2,452 2,870	57.80 65.56	791 1,106	NEPOOL NEPOOL	NEPOOL_7_CT NEPOOL 7 CT	1543 1543	4,447 4,447	3,920 3,920	-416 -416	-1,722 -1,722	82.40 82.40	-53 -53	24.6 16.8	5836 8760	66% 100%
	NYISO_3_NYC NYISO 6 NYF	7512	4,103	1,983	1,926	1,834	70.70	314	NEPOOL NEPOOL	NEPOOL_7_CT NEPOOL 7 CT	1543 1543	4,447	3,920	-416 -416	-1,722	82.40 82.40	-53 -53	16.8	8757	100%
	NEPOOL 3 ME	3787	3,494	2,522	344	1,034	67.04	87	NEPOOL	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	-53	15.4	7777	89%
NYPP	NYISO_8_NYH	8760	2,021	973	1,570	1,958	75.23	1,035	NEPOOL	NEPOOL_7_CT	1543	4,447	3,920	-416	-1,722	82.40	-53	7.2		100%
NEPOOL	NEPOOL_3_ME	3787	3,494	2,522	344	1,072	67.04	87	NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-736	-1,303	73.99	-477	6.9	8756	100%
NEPOOL	NEPOOL_5_SEMA	8739	6,454	3,978	1,588	3,670	71.41	991	NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-736	-1,303	73.99	-477	2.6	8757	100%
NYPP NYPP	NYISO_1_NYA NYISO 6 NYF	8292	4,946 4,103	2,500 1.983	1,651 591	2,452	57.80 70.70	791 314	NEPOOL	NEPOOL_9_NWKST NEPOOL_9_NWKST	8760	405 405	1,524 1.524	-736	-1,303	73.99	-477 -477	16.2	5840	66%
NYPP	NYISO_6_NYF NYISO 3 NYC	7512 8760	6,711	2,657	1.926	1,834 2.870	65.56	1,106	NEPOOL NEPOOL	NEPOOL_9_NWKST	8760 8760	405	1,524	-736 -736	-1,303 -1,303	73.99 73.99	-477 -477	3.3 8.4	8760 8760	100%
NEPOOL	NEPOOL 2 NH	8425	4,204	2,621	1,000	1,918	68.48		NEPOOL	NEPOOL 9 NWKST	8760	405	1,524	-736	-1,303	73.99	-477	5.5	8758	100%
NEPOOL	NEPOOL_7_CT	7217	4,447	3,920	641	1,828	70.94	328	NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-736	-1,303	73.99	-477	3.0	8757	100%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,394	40.89		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,616	-9,590	45.30	-2,229	4.4	4034	46%
MISO	ALTE_2_MSA_Madison_G	8749	1,665	441	498	1,033	37.26	162	PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,616	-9,590	45.30	-2,229	8.0	4790	55%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub I	nformation								Sink Hub Info	rmation							1	Congestion	Indicators	
					Average									Average				<u> </u>		
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
	II. I. Nicos	Source	Gen	Load	injection	injection	Price	surplus		II I Nove	Sink	Gen	Load	injection	injection	Price	surplus	Price	U90	1100.07
Market Area PJM	Hub Name NI 7 MSA Rochelle G	Hours 8760	Weight 2,290	Weight	(MW) 2.119	(MW) 2,290	(\$/MWh) 40.58	(\$MM) 753	Market Area PJM	Hub Name NI 13 MSA Chicago L	Hours 8760	Weight 2,396	Weight 10,556	(MW) -5.616	(MW) -9,590	(\$/MWh) 45,30	(\$MM) -2.229	Differential 4.7	Hours 2893	U90 % 33%
MISO	AMRN 12 MSA StLouis L	6286	5,059	6.066	623	1,639	36.94			NI 13 MSA Chicago L	8760	2,396	10,556	-5,616	-9,590	45.30	-2,229	8.4	6268	
P.JM	NI 15 MSA Davenport G	8712	2,479	0,000	1.682	2.314	37.11	544		NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,616	-9,590	45.30	-2,229	8.2	2519	
MISO	IP_8_GEN_Clinton_G	7994	2,302	1.195	924	1,212	43.68			NI 13 MSA Chicago L	8760	2,396	10,556	-5,616	-9,590	45.30	-2,229	1.6	1092	12%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,394	40.89	320		NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	45.12	-252	4.2	3788	
MISO	IP_8_GEN_Clinton_G	7994	2,302	1,195	924	1,212	43.68	323		NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	45.12	-252	1.4	1025	12%
MISO	AMRN_12_MSA_StLouis_L	6286	5,059	6,066	623	1,639	36.94			NI_3_MSA_Chicago_L	8760	26		-638	-1,267	45.12	-252	8.2	6210	
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,682	2,314	37.11			NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	45.12	-252	8.0	2558	
MISO	ALTE_2_MSA_Madison_G	8749	1,665	441	498	1,033	37.26			NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	45.12	-252	7.9	4795	
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	40.58			NI_3_MSA_Chicago_L	8760	26		-638	-1,267	45.12	-252	4.5		
MISO MISO	AMRN_12_MSA_StLouis_L	6286 7994	5,059 2,302	6,066	623	1,639	36.94 43.68			NI_6_MSA_Chicago_G	1489 1489	9,759	7,577	-356	-1,470 -1,470	45.98 45.98	-24 -24	9.0 2.3	6277	
MISO	IP_8_GEN_Clinton_G	7994 8749	1,665	1,195 441	924 498	1,212 1,033	37.26			NI_6_MSA_Chicago_G NI_6_MSA_Chicago_G	1489	9,759 9,759	7,577 7,577	-356 -356	-1,470	45.98	-24 -24	8.7	462 4518	
MISO	ALTE_2_MSA_Madison_G WEC_1_MSA_Chicago_G	8592	1,728	303	912	1,033	40.89			NI_6_MSA_Chicago_G	1489	9,759	7,577	-356	-1,470	45.98	-24	5.1	4033	
	NI_15_MSA_Davenport_G	8712	2,479	0	1,682	2,314	37.11			NI_6_MSA_Chicago_G	1489	9,759	7,577	-356	-1,470	45.98	-24	8.9		
	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	40.58			NI_6_MSA_Chicago_G	1489	9,759	7,577	-356	-1,470	45.98	-24	5.4	2964	
	NYISO 6 NYF	7512	4,103	1,983	591	1,834	70.70			NYISO 10 NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	7.5	8759	
NEPOOL	NEPOOL 2 NH	8425	4,204	2,621	1,000	1,918	68.48			NYISO 10 NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	9.8	8760	
ONTARIO	IESO_7_G	8760	2,953	253	2,506	2,829	56.39	1,238	NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	21.8	8760	100%
NYPP	NYISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80			NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	20.4	8759	
PJM	PENELEC_2_MSA_DuBois_G	8745	2,724	1,196	1,004	1,719	59.08			NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	19.2	5837	
	NYISO_8_NYH	8760	2,021	973	1,570	1,958	75.23			NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	3.0	8757	
NEPOOL	NEPOOL 5 SEMA	3787	3,494	2,522	344	1,072	67.04			NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	11.2	8760	
NEPOOL NEPOOL	NEPOOL_5_SEMA	8739	6,454	3,978	1,588	3,670	71.41 70.94			NYISO_10_NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	6.8	8760	
NYPP	NEPOOL_7_CT NYISO 3 NYC	7217 8760	4,447 6,711	3,920 2,657	641 1,926	1,828 2,870	65.56			NYISO_10_NYJ NYISO 10 NYJ	8760 8760	10,283 10,283	11,493 11,493	-3,562 -3,562	-5,473 -5,473	78.24 78.24	-2,441 -2,441	7.3 12.7	8759 8759	100%
ONTARIO	IESO_6_G	8760	2,146	147	2,493	2,787	56.38			NYISO 10 NYJ	8760	10,283	11,493	-3,562	-5,473	78.24	-2,441	21.9	8760	
ONTARIO	IESO 6 G	8760	2,146	147	2,493	2,787	56.38			NYISO 11 NYK	8760	5.681	5,289	-1,977	-2.892	77.87	-1.349	21.5	5838	66%
PJM	PENELEC 2 MSA DuBois G	8745	2,724	1,196	1,004	1,719	59.08			NYISO 11 NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	18.8	5838	66%
NYPP	NYISO 6 NYF	7512	4,103	1,983	591	1,834	70.70			NYISO 11 NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	7.2	8760	
NEPOOL	NEPOOL_3_ME	3787	3,494	2,522	344	1,072	67.04			NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	10.8	8760	
NYPP	NYISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80	791	NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	20.1	5838	66%
NEPOOL	NEPOOL_5_SEMA	8739	6,454	3,978	1,588	3,670	71.41			NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	6.5	8760	
NEPOOL	NEPOOL_2_NH	8425	4,204	2,621	1,000	1,918	68.48			NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	9.4	8760	100%
NEPOOL	NEPOOL_7_CT	7217	4,447	3,920	641	1,828	70.94			NYISO_11_NYK	8760	5,681	5,289	-1,977	-2,892	77.87	-1,349	6.9	8760	
NYPP NYPP	NYISO_3_NYC	8760 8760	6,711 2.021	2,657 973	1,926	2,870 1,958	65.56 75.23	1,106		NYISO_11_NYK NYISO 11 NYK	8760 8760	5,681 5.681	5,289 5,289	-1,977	-2,892 -2.892	77.87 77.87	-1,349	12.3 2.6	8760	
ONTARIO	NYISO_8_NYH IESO 7 G	8760	2,953	253	1,570 2,506	2,829	56.39	1,035		NYISO_TI_NTK	8760	5,681	5,289	-1,977 -1,977	-2,892	77.87	-1,349 -1,349	21.5	8749 5838	
ONTARIO	IESO_7_G IESO 6 G	8760	2,953	147	2,506	2,829	56.38			NYISO_TI_NTK NYISO 7 NYG	8404	3,156	2,195	-1,977	-1,818	72.54	-1,349	16.2	5801	
NYPP	NYISO 1 NYA	8292	4,946	2,500	1,651	2,452	57.80			NYISO 7 NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	14.7	5700	
NEPOOL	NEPOOL 2 NH	8425	4,204	2,621	1,000	1,918	68.48			NYISO 7 NYG	8404	3,156	2,195	-826	-1.818	72.54	-503	4.1	6318	
ONTARIO	IESO 7 G	8760	2,953	253	2,506	2,829	56.39			NYISO 7 NYG	8404	3,156	2,195	-826	-1.818	72.54	-503	16.2	5802	
NEPOOL	NEPOOL_7_CT	7217	4,447	3,920	641	1,828	70.94	328	NYPP	NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	1.6	5257	60%
PJM	PENELEC_2_MSA_DuBois_G	8745	2,724	1,196	1,004	1,719	59.08	519	NYPP	NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	13.5	5769	66%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,926	2,870	65.56			NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	7.0	5475	
NEPOOL	NEPOOL_3_ME	3787	3,494	2,522	344	1,072	67.04			NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	5.5	5699	
NYPP	NYISO_6_NYF	7512	4,103	1,983	591	1,834	70.70			NYISO_7_NYG	8404	3,156	2,195	-826	-1,818	72.54	-503	1.8		
NEPOOL NEPOOL	NEPOOL 5 SEMA	8739	6,454	3,978	1,588	3,670	71.41		NYPP	NYISO_7_NYG	8404 8288	3,156	2,195	-826	-1,818	72.54 77.00	-503 -539	1.1	5429	
NEPOOL NEPOOL	NEPOOL_5_SEMA NEPOOL 7 CT	8739 7217	6,454 4,447	3,978 3,920	1,588 641	3,670 1,828	71.41 70.94		NYPP NYPP	NYISO_9_NYI NYISO 9 NYI	8288 8288	2	1,476 1,476	-845 -845	-2,165 -2,165	77.00	-539 -539	5.6 6.1	8670 8599	
NEPOOL	NEPOOL_7_C1	3787	3,494	2,522	344	1,828	67.04			NYISO_9_NYI	8288	2	1,476	-845 -845	-2,165	77.00	-539	10.0		
NYPP	NYISO 8 NYH	8760	2,021	973	1,570	1,072	75.23			NYISO 9 NYI	8288	2	1,476	-845	-2,165	77.00	-539	1.8	7125	
NEPOOL	NEPOOL 2 NH	8425	4,204	2,621	1,000	1,918	68.48			NYISO 9 NYI	8288	2	1,476	-845	-2,165	77.00	-539	8.5	8751	
ONTARIO	IESO 7 G	8760	2,953	253	2,506	2,829	56.39		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	20.6	5821	
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,926	2,870	65.56		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	11.4	8675	
NYPP	NYISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80			NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	19.2	5780	
NYPP	NYISO_6_NYF	7512	4,103	1,983	591	1,834	70.70	314		NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	6.3	8625	
ONTARIO	IESO_6_G	8760	2,146	147	2,493	2,787	56.38			NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	20.6	5818	
PJM	PENELEC_2_MSA_DuBois_G	8745	2,724	1,196	1,004	1,719	59.08	519	NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	77.00	-539	17.9	5767	66%
000	AEDW O MOA								000	OKGE_4_MSA_OklahomaCity					,					
SPP	AEPW_9_MSA_MountPleasant_	8404	8,168	3,832	852	2,045	52.70	377	SPP	_L	8737	2,102	2,403	-819	-1,686	73.28	-525	20.6	7126	81%
SPP	WERE 1 MSA Manhattan G	8684	2,988	409	1,338	2,255	39.48	450	SPP	OKGE_4_MSA_OklahomaCity	8737	2,102	2,403	-819	-1,686	73.28	-525	33.8	8204	93%
JI 1	WEITE I WOA WAIHAUAII G	0004	2,300	409	1,000	2,233	33.40	409		_L OKGE_4_MSA_OklahomaCity	0131	2,102	2,403	-019	-1,000	13.20	-525	55.0	0204	3376
SPP	AEPW 5 MSA Tulsa G	7582	4,226	2,571	425	1,275	48.49	156	SPP	L	8737	2,102	2,403	-819	-1,686	73.28	-525	24.8	6318	72%
	oo, a.oa_o		-,0	,_,,		.,_,				OKGE_4_MSA_OklahomaCity	2.01	_,.02	_, .00	2.10	.,550		5_0		5510	/0
				, ,																
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,923	2,737	51.76	870	SPP	_L	8737	2,102	2,403	-819	-1,686	73.28	-525	21.5	7906	90%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub I	nformation								Sink Hub Info	rmation								Congestion	Indicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	U90	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
										PECO_5_MSA_Philadelphia_										
PJM	BGE_7_MSA_Baltimore-Towson	8161	2,548	1,043	660	1,099	71.25	384	PJM	DECO E MCA Philodolphia	6627	1,656	2,510	-372	-2,388	78.95	-195	7.7	4391	50%
РЈМ	PJM500 7 MSA York-Hanover	8760	2,696	0	2,070	2,570	70.66	1,282	PJM	PECO_5_MSA_Philadelphia_ L	6627	1,656	2,510	-372	-2,388	78.95	-195	8.3	1968	22%
										PECO_5_MSA_Philadelphia_		,,,,,,								
PJM	PJM500_4_MSA_Philadelphia_0	8645	2,383	0	1,579	3,295	70.92		PJM	L DEDOG 4 MOA DO 1	6627	1,656	2,510	-372	-2,388	78.95	-195	8.0	0	0%
PJM PJM	PJM500_3_MSA_Pittsburgh_G AP_1_County_Harrison_G	8760 8760	1,705 6,563	2.223	1,430 2,674	1,700 3,962	56.53 56.52	1,324	PJM P IM	PEPCO_1_MSA_DC_L PEPCO_1_MSA_DC_L	8760 8760	0	1,439 1,439	-883 -883	-1,547 -1,547	70.14 70.14	-543 -543	13.6 13.6	7630 7610	87% 87%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05		PJM	PEPCO_1_MSA_DC_L	8760	0	1,439	-883	-1,547	70.14	-543	13.1	7593	86%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05		PJM	PL_5_MSA_Lancaster_L	8760	0		-721	-1,027	69.59	-439	12.5	5869	67%
PJM PJM	PJM500_3_MSA_Pittsburgh_G PENELEC 2 MSA DuBois G	8760 8745	1,705 2,724	1,196	1,430 1,004	1,700 1,719	56.53 59.08		PJM PJM	PL_5_MSA_Lancaster_L PL 5 MSA Lancaster L	8760 8760	0	897 897	-721 -721	-1,027 -1,027	69.59 69.59	-439 -439	13.1 10.5	7248 7727	83% 88%
PJM	PENELEC_2_MSA_DUBOIS_G PENELEC 2 MSA DuBois G	8745	2,724	1,196	1,004	1,719	59.08	0.0	P.JM	PL 7 MSA Allentown L	8760	245	1,051	-695	-1,027	69.49	-439	10.5	7432	85%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	736	PJM	PL_7_MSA_Allentown_L	8760	245	1,051	-695	-1,038	69.49	-423	12.4	7292	83%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,430	1,700	56.53		PJM	PL_7_MSA_Allentown_L	8760	245	1,051	-695	-1,038	69.49	-423	13.0	8255	94%
NYPP NYPP	NYISO_1_NYA NYISO 3 NYC	8292 8760	4,946 6,711	2,500 2,657	1,651 1,926	2,452 2,870	57.80 65.56	791 1,106	PJM D IM	PSEG_3_MSA_NewYork_L PSEG 3 MSA NewYork L	8760 8760	1,843 1,843	2,275 2,275	-1,004 -1,004	-2,093 -2,093	70.31 70.31	-618 -618	12.5 4.8	8353 8262	95% 94%
INTE	N1130_3_N10	6700	0,711	2,007	1,320	2,070	05.50	1,100	r Jivi	F SEG_S_WISA_New TOR_E	0700	1,043	2,213	-1,004	-2,033	70.51	-010	4.0	0202	34 /6
NYPP	NYISO_1_NYA	8292	4,946	2,500	1,651	2,452	57.80	791	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-961	-2,077	70.95	-597	13.2	8348	95%
NIVOD.	NN/100 0 NN/0	0700	0.744	0.057	4 000	0.070	05.50	4 400	D.114	DOEO 5 MOA DUIL LILLY I	0700	0.440	0.700	004	0.077	70.05	507		7000	000/
NYPP NYPP	NYISO_3_NYC NYISO 3 NYC	8760 8760	6,711 6,711	2,657 2,657	1,926 1,926	2,870 2,870	65.56 65.56	1,106 1,106		PSEG_5_MSA_Philadelphia_L PSEG 8 MSA NewYork G	8760 8760	2,143 3,860	2,766 3,654	-961 -1,202	-2,077 -2,535	70.95 70.29	-597 -740	5.4 4.7	7883 8181	90% 93%
	NYISO 1 NYA	8292	4,946	2,500	1,651	2,452	57.80	791		PSEG_8_MSA_NewYork_G	8760	3,860	3,654	-1,202	-2,535	70.29	-740	12.5	8148	93%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	VACAR	SCEG_9_MSA_Charleston_G	8571	1,152	1,944	-410	-1,082	56.48	-199	1.2	1866	21%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00	672	VACAR	SCEG_9_MSA_Charleston_G	8571	1,152	1,944	-410	-1,082	56.48	-199	1.5	1866	21%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483	VACAR	SCEG_9_MSA_Charleston_G	8571	1,152	1,944	-410	-1,082	56.48	-199	1.0	1587	18%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788	VACAR	SCEG_9_MSA_Charleston_G	8571	1,152	1,944	-410	-1,082	56.48	-199	1.5	1853	21%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,418	-3,042	57.60	-716	2.1	853	10%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00	672	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,418	-3,042	57.60	-716	2.6	4119	47%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,418	-3,042	57.60	-716	2.3	4116	47%
VACAR	SCPSA_10_MSA_Charleston_G	8760	1,680	0	1,437	1,680	56.12	706	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,418	-3,042	57.60	-716	1.5	1282	15%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788	VACAR	SCPSA_2_MSA_Charleston_L SOCO_10_MSA_Albany-	8760	1,607	3,236	-1,418	-3,042	57.60	-716	2.6	4118	47%
VACAR	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	3,071	5,821	54.45	1,429	SOUTHERN	Valdosta_L SOCO_10_MSA_Albany-	7847	3,431	4,125	-722	-2,957	58.46	-331	4.0	472	5%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	850	1,211	55.21	378	SOUTHERN	Valdosta_L SOCO_10_MSA_Albany-	7847	3,431	4,125	-722	-2,957	58.46	-331	3.2	474	5%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,110	6,381	55.47	2,483	SOUTHERN	Valdosta_L	7847	3,431	4,125	-722	-2,957	58.46	-331	3.0	143	2%
	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7847	3,431	4,125	-722	-2,957	58.46	-331	6.7	2147	24%
IVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	17,334	9,966	2,978	7,160	52.39	1,366	SOUTHERN	SOCO_10_MSA_Albany-Valdo	7847	3,431	4,125	-722	-2,957	58.46	-331	6.1	228	3%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	3,574	2,674	499	1,541	56.69	212	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L SOCO_10_MSA_Albany-	7847	3,431	4,125	-722	-2,957	58.46	-331	1.8	525	6%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,179	9,751	55.29	2,024	SOUTHERN	Valdosta_L SOCO_10_MSA_Albany-	7847	3,431	4,125	-722	-2,957	58.46	-331	3.2	146	2%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,394	1,959	55.00	672	SOUTHERN	Valdosta_L	7847	3,431	4,125	-722	-2,957	58.46	-331	3.5	224	3%
VACAR	SCEG_1_MSA_Columbia_G	7998	4,954	2,752	999	2,547	56.98	455		SOCO_10_MSA_Albany-Valdo	7847	3,431	4,125	-722	-2,957	58.46	-331	1.5	354	4%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	12,464	9,217	1,684	5,534	55.02	788	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7847	3,431	4,125	-722	-2,957	58.46	-331	3.4	215	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	17,334	9,966	2,978	7,160	52.39	1,366	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,369	-2,611	55.30	-663	2.9	103	1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,369	-2,611	55.30	-663	3.5	1555	18%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_17_MSA_Mobile_G	6866	5,205	4,575	-445	-1,762	54.55	-167	2.8	3405	39%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G TVA 1 MSA Chatt-Hunts G	8754 8754	17,334 17,334	9,966 9,966	2,978 2,978	7,160 7,160	52.39 52.39	1,366 1,366	SOUTHERN	SOCO_17_MSA_Mobile_G SOCO 21 MSA Atlanta G	6866 8716	5,205 3,334	4,575 2,733	-445 -721	-1,762 -1,542	54.55 55.12	-167 -346	2.2 2.7	3024 94	34% 1%
								.,											-	.,,
IVAUIHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_21_MSA_Atlanta_G	8716	3,334	2,733	-721	-1,542	55.12	-346	3.3	1947	22%

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion	Indicators	
					Average			_						Average			_	- I good a		
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price	1190	
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	Hours	U90 %
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	55.32	-946	3.5	1670	19%
TVAUTHOR	TVA 1 MSA Chatt-Hunts G	8754	17,334	9,966	2,978	7,160	52.39	1,366	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	55.32	-946	2.9	219	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	17,334	9,966	2,978	7,160	52.39	1,366	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,970	-3,246	55.44	-957	3.0	389	4%
TVAUTHOR	TVA 4 MSA Clarksville G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO 5 GEN GEPCHY L	8760	2,098	3,403	-1,970	-3,246	55.44	-957	3.7	1764	20%
										SOCO_6_MSA_Augusta-										
VACAR	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	3,071	5,821	54.45	1,429	SOUTHERN	Richmond_L SOCO_6_MSA_Augusta-	8760	0	1,187	-720	-1,220	55.53	-350	1.1	314	4%
TVAUTHOR	TVA 1 MSA Chatt-Hunts G	8754	17,334	9,966	2,978	7,160	52.39	1,366	SOUTHERN	Richmond_L	8760	0	1,187	-720	-1,220	55.53	-350	3.1	83	1%
				·						SOCO_6_MSA_Augusta-										
	TVA_4_MSA_Clarksville_G	8592 8592	2,544 2,544	150 150	2,121 2,121	2,481	51.78	944	SOUTHERN	Richmond_L	8760	0	1,187	-720 -1.139	-1,220 -1,932	55.53 55.32	-350 -552	3.7 3.5	1393	16% 19%
IVAUIHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,121	2,481	51.78	944	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	55.32	-552	3.5	1651	19%
	TVA_1_MSA_Chatt-Hunts_G	8754	17,334	9,966	2,978	7,160	52.39	1,366		SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	55.32	-552	2.9	219	2%
MISO	EKPC_8_MSA_Maysville_G	8760	1,396	272	849	1,088	49.57	369		TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,298	-2,941	50.62	-575	1.1	2173	25%
MISO MISO	LGEE_3_GEN_Gehnt2_G LGEE 3 GEN Gehnt2 G	8760 8760	2,000	225 225	1,554 1,554	1,900	44.67 44.67	608 608		TVA_3_MSA_Knoxville_L TVA 5 MSA Nashville L	8760 8646	3,684 9,154	5,102 8,858	-1,298 -1,614	-2,941 -5,752	50.62 52.89	-575 -738	6.0 8.2	5050 6728	57% 77%
MISO	EKPC 8 MSA Maysville G	8760	1,396	272	849	1,088	49.57	369		TVA_5_WSA_Nashville_L	8646	9,154	8,858	-1,614	-5,752	52.89	-738	3.3	1444	16%
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,923	2,737	51.76	870		TVA 5 MSA Nashville L	8646	9,154	8,858	-1,614	-5,752	52.89	-738	1.1	2464	28%
MISO	BREC_3_County_Webster_G	8760	1,355	476	891	1,191	41.70	325	TVAUTHOR	TVA_5_MSA_Nashville_L	8646	9,154	8,858	-1,614	-5,752	52.89	-738	11.2	7262	83%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,095	1,597	47.78	458		TVA_5_MSA_Nashville_L	8646	9,154	8,858	-1,614	-5,752	52.89	-738	5.1	2808	32%
PJM TVAUTHOR	AEP_8_GEN_Amos01_G	8760 8592	19,694 2,544	6,544 150	5,868 2,121	10,212 2,481	50.44 51.78	2,593 944	TVAUTHOR TVAUTHOR	TVA_5_MSA_Nashville_L TVA 5 MSA Nashville L	8646 8646	9,154 9,154	8,858 8,858	-1,614 -1,614	-5,752 -5,752	52.89 52.89	-738 -738	2.4	2876	33%
MISO	TVA_4_MSA_Clarksville_G LGEE 3 GEN Gehnt2 G	8760	2,000	225	1,554	1,900	44.67	608			8753	7,215	5,982	-1,814	-5,752 -4,409	51.92	-736	7.2	5507	0% 63%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6,544	5,868	10,212	50.44	2.593	TVAUTHOR	TVA 7 MSA Memphis L	8753	7,215	5,982	-1,824	-4,409	51.92	-829	1.5	864	10%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-590	-1,124	65.06	-336	14.6	7929	90%
VACAR	CPLE_1_MSA_Durham_G	7930	10,224	8,563	1,125	2,523	57.05		PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-590	-1,124	65.06	-336	8.0	6562	75%
PJM PJM	AP_1_County_Harrison_G	8760 8664	6,563 1,700	2,223	2,674 1,490	3,962	56.52 57.05	1,324 736	PJM PJM	VAP_15_MSA_VB-Norfolk_L	8760 8760	435 435	1,297	-590 -590	-1,124	65.06	-336 -336	8.5 8.0	7645 7675	87%
PJM	PJM500_9_MSA_Pittsburgh_G PJM500_3_MSA_Pittsburgh_G	8760	1,700	0	1,490	1,700 1,700	56.53	736		VAP_15_MSA_VB-Norfolk_L VAP 15 MSA VB-Norfolk L	8760	435	1,297 1,297	-590 -590	-1,124 -1.124	65.06 65.06	-336	8.0	7675	87% 88%
PJM	AEP 8 GEN Amos01 G	8760	19,694	6.544	5,868	10,212	50.44	2.593	PJM	VAP 27 MSA DC L	8760	433	1,048	-643	-1,124	68.61	-386	18.2	7965	91%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	68.61	-386	2.6	2897	33%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	736		VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	68.61	-386	11.6	7547	86%
PJM	VAP_7_G	6600	4,179	303	1,771	3,623	64.38	752	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	68.61	-386	4.2	5383	61%
VACAR PJM	CPLE_1_MSA_Durham_G AP 1 County Harrison G	7930 8760	10,224 6,563	8,563 2,223	1,125 2,674	2,523 3,962	57.05 56.52	509 1.324		VAP_27_MSA_DC_L VAP 27 MSA DC L	8760 8760	0	1,048 1,048	-643 -643	-1,075 -1.075	68.61 68.61	-386 -386	11.6 12.1	7450 7573	85% 86%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	2,223	1,430	1,700	56.53	708		VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	68.61	-386	12.1	7601	87%
PJM	VAP_7_G	6600	4,179	303	1,771	3,623	64.38	752		VAP_33_MSA_DC_L	8760	910	2,983	-1,875	-2,931	68.74	-1,129	4.4	5401	61%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048		VAP_33_MSA_DC_L	8760	910	2,983	-1,875	-2,931	68.74	-1,129	2.7	3574	41%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,674	3,962	56.52	1,324		VAP_33_MSA_DC_L	8760	910	2,983 2,983	-1,875	-2,931	68.74 68.74	-1,129	12.2	7624	87% 87%
VACAR PJM	CPLE_1_MSA_Durham_G PJM500 3 MSA Pittsburgh G	7930 8760	10,224 1,705	8,563	1,125 1,430	2,523 1,700	57.05 56.53	509 708	PJM PJM	VAP_33_MSA_DC_L VAP 33 MSA DC L	8760 8760	910 910	2,983	-1,875 -1,875	-2,931 -2,931	68.74	-1,129 -1,129	11.7 12.2	7618 7707	88%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	5,868	10,212	50.44	2,593		VAP_33_MSA_DC_L	8760	910	2,983	-1,875	-2,931	68.74	-1,129	18.3	8060	92%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05	736	PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,875	-2,931	68.74	-1,129	11.7	7705	88%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,674	3,962	56.52	1,324		VAP_7_G	2160	4,179	303	-1,029	-2,509	76.12	-169	19.6	5807	66%
PJM PJM	AEP_8_GEN_Amos01_G PJM500_5_MSA_DC_G	8760 8760	19,694 1,730	6,544	5,868 1,600	10,212 1,730	50.44 70.80	2,593 992		VAP_7_G VAP 7 G	2160 2160	4,179 4,179	303 303	-1,029 -1.029	-2,509 -2,509	76.12 76.12	-169 -169	25.7 5.3	6065 5141	69% 59%
PJM PJM	PJM500_5_MSA_DC_G PJM500_4_MSA_Philadelphia_0	8645	2,383	0	1,600	3,295	70.80		PJM PJM	VAP_7_G VAP_7_G	2160	4,179	303	-1,029	-2,509 -2,509	76.12 76.12	-169	5.3	5728	65%
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,543	6,081	66.00	2,048		VAP_7_G VAP_7_G	2160	4,179	303	-1,029	-2,509	76.12	-169	10.1	5479	62%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,490	1,700	57.05		PJM	VAP_7_G	2160	4,179	303	-1,029	-2,509	76.12	-169	19.1	7205	82%
VACAR	CPLE_1_MSA_Durham_G	7930	10,224	8,563	1,125	2,523	57.05		PJM	VAP_7_G	2160	4,179	303	-1,029	-2,509	76.12	-169	19.1	5410	62%
PJM PJM	PJM500_3_MSA_Pittsburgh_G PJM500 7 MSA York-Hanover	8760 8760	1,705 2,696	0	1,430 2,070	1,700 2,570	56.53 70.66	708 1,282	PJM P IM	VAP_7_G VAP_7_G	2160 2160	4,179 4,179	303 303	-1,029 -1.029	-2,509 -2,509	76.12 76.12	-169 -169	19.6 5.5	7148 6187	81% 70%
i Jivi	I SINISOU_1_INISA_1UIK-HAIIOVEI	0100	2,090	U	2,070	2,570	70.06	1,202	JIVI	V/N _/_U	2100	4,179	303	-1,029	-2,509	70.12	-109	ა.5	0107	10%
SPP	KACP_4_MSA_KansasCity_G	7896	670	0	1,121	1,520	16.87	149	SPP	WERE_4_GEN_Wolfcreek_G	4506	3,510	2,459	-454	-1,676	58.79	-120	41.9	7403	84%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,095	1,597	47.78	458	SPP	WERE_4_GEN_Wolfcreek_G	4506	3,510	2,459	-454	-1,676	58.79	-120	11.0	7927	90%
SPP	WERE 1 MSA Manhattan G	8684	2.988	409	1,338	2,255	39.48	459	SPP	WERE 4 GEN Wolfcreek G	4506	3,510	2,459	-454	-1,676	58.79	-120	19.3	1483	17%
			,		.,550		33.40							.04		33.73		.5.5	1-00	17.70
SPP	AEPW_5_MSA_Tulsa_G	7582	4,226	2,571	425	1,275	48.49	156	SPP	WERE_4_GEN_Wolfcreek_G	4506	3,510	2,459	-454	-1,676	58.79	-120	10.3	4447	51%
MADD	NIDDD 4 CEN COMPANY	00.4-	0.700		050	4.555	47.4-	100	CDD	WEDE 4 OEN WATER CO.	1500	0.540	0.450	45.	4.070	50.70	100		074-	2001
MAPP MISO	NPPD_4_GEN_Gentleman_G OTP_9_GEN_BigStone_G	8247 8640	2,702 1,189	148 136	850 897	1,575 1,677	17.45 13.77	122	SPP MISO	WERE_4_GEN_Wolfcreek_G XEL 3 MSA Minneapolis G	4506 5869	3,510 7,596	2,459 7,622	-454 -992	-1,676 -2,499	58.79 49.87	-120 -290	41.3 36.1	8717 8647	99% 98%
MISO	ALTE 2 MSA Madison G	8749	1,169	441	498	1,077	37.26		MISO	XEL 3 MSA Minneapolis G	5869	7,596	7,622	-992	-2,499	49.87	-290	12.6	3293	37%
			.,		.50	.,250						.,250	.,							<u> </u>

Task 2: Appendix 4, Corridors Results by Scenario HighCase2011R2

Source Hub Information									C:al. IIb lata									C	l= di==+==	
Source Hub In	IIOIIIIau0II				Average				Sink Hub Info	iiiiauoii				Average				Congestion	mulcators	
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Market Area	Hub Name	Sink Hours	Gen Weight	Load Weight	net injection (MW)	Max net injection (MW)	Average Price (\$/MWh)	Revenue surplus (\$MM)	Price Differential	U90 Hours	U90 %
							, ,									, ,	(, ,			
																				<b></b>
l																				<del></del>
																				<del>                                     </del>
																				T
																				Ь——
$\vdash$							-						-				-			<b>—</b>
$\vdash$																				<del>                                     </del>
$\vdash$							-						-				-			<del></del>
																				<b>├</b>
																				<del>                                     </del>
																				<del>                                     </del>
																				<del>                                     </del>
																				<del>                                     </del>
																				<del>                                     </del>
																				<b>├</b>
$\vdash$							<b> </b>					<del>                                     </del>	<b> </b>				<b> </b>			<del>                                     </del>
										-										<u> </u>
$\vdash$												<del>                                     </del>								<del>                                     </del>
	· · · · · · · · · · · · · · · · · · ·																			<b>—</b>
$\vdash$												<del>                                     </del>								<del>                                     </del>
$\vdash$							<b> </b>					<del>                                     </del>	<b> </b>				<b> </b>			<del>                                     </del>
	_																			
<u> </u>																				<del> </del>
$\vdash$							-						-				-			<del></del>

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion I	ndicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)		U90 Hours	U90 %
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,562	4,192	32.75	1,022		AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	3.8	4673	53%
PJM	NI_6_MSA_Chicago_G	7988	9,759	7,577	995	2,915	32.98	262	PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	3.6	4687	53%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24		PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	7.3	5854	67%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,695	2,361	27.05	399	PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	9.5	5687	65%
	NI_20_MSA_Chicago_G	7900	1,632	83	892	1,578	32.69	230	PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	3.9	4663	53%
	NIPS_8_MSA_Chicago_G	8692	2,892	1,694	817	1,465	32.55		PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	4.0	4403	50%
	IPL_2_MSA_Jasper_G	8760	1,678	0	1,417	1,664	33.29		PJM	AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	3.3	6977	79%
	AMRN_12_MSA_StLouis_L	6285	5,059	6,066	625	1,758	27.33			AEP_1_MSA_Lynchburg_G	8760	843	2,162	-1,598	-2,230	36.54	-511	9.2	7617	87%
	NI_20_MSA_Chicago_G	7900	1,632	83	892	1,578	32.69			AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,727	-2,729	36.02	-545	3.3	1433	16%
	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,562	4,192	32.75	1,022		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,727	-2,729	36.02	-545	3.3	1350	15%
	NI_6_MSA_Chicago_G	7988	9,759	7,577	995	2,915	32.98		PJM	AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,727	-2,729	36.02	-545	3.0	1364	16%
PJM PJM	NI_7_MSA_Rochelle_G	8760 8712	2,290 2,479	0	2,119 1,695	2,290 2,361	29.24 27.05		PJM PJM	AEP_2_STA_TN-WV_L	8760 8760	1,284 1,284	2,977 2,977	-1,727 -1.727	-2,729 -2,729	36.02 36.02	-545 -545	6.8 9.0	4048 3712	46% 42%
MISO	NI_15_MSA_Davenport_G NIPS 8 MSA Chicago G	8692	2,479	1,694	817	1,465	32.55		PJM	AEP_2_STA_TN-WV_L AEP 2 STA TN-WV L	8760	1,284	2,977	-1,727	-2,729	36.02	-545 -545	3.5	1022	12%
MISO	AMRN 12 MSA StLouis L	6285	5,059	6,066	625	1,465	27.33		PJM	AEP_2_STA_TN-WV_L AEP 2 STA TN-WV L	8760	1,284	2,977	-1,727	-2,729	36.02	-545 -545	8.7	6695	76%
MISO	LGEE 3 GEN Gehnt2 G	8760	2.000	225	1,554	1,736	33.05	450		AEP_2_STA_TN-WV_L	8760	1,284	2,977	-1,727	-2,729	36.02	-545	3.0	4876	56%
MISO	IPL_2_MSA_Jasper_G	8760	1,678	223	1,417	1,664	33.29		PJM	AEP 2 STA TN-WV L	8760	1,284	2,977	-1,727	-2,729	36.02	-545	2.7	6236	71%
50	II L_Z_WOA_Jaspei_G	57.50	1,070	U	1,717	1,004	55.25	713		AEP 9 MSA Canton-	5730	1,204	2,511	1,121	2,123	50.02	545	2.1	0230	1 1 70
PJM	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,562	4,192	32.75	1,022	PJM	Massillon L	8760	733	2,120	-1,461	-2,211	36.51	-467	3.8	1955	22%
	<i>Dr</i> (_0/modgo_0	3.30	0,012	.,200	0,002	.,.02	02.70	.,022		AEP_9_MSA_Canton-	3.30	.00	2,.20	.,.01	_,	33.31	.07	5.0	.000	
MISO	AMRN_12_MSA_StLouis_L	6285	5,059	6,066	625	1,758	27.33	107	PJM	Massillon L	8760	733	2,120	-1,461	-2,211	36.51	-467	9.2	6851	78%
			-,	-,		,				AEP 9 MSA Canton-			,	, -						
MISO	IPL 2 MSA Jasper G	8760	1,678	0	1,417	1,664	33.29	413	PJM	Massillon L	8760	733	2,120	-1,461	-2,211	36.51	-467	3.2	6369	73%
										AEP_9_MSA_Canton-										
PJM	NI_6_MSA_Chicago_G	7988	9,759	7,577	995	2,915	32.98	262	PJM	Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	-467	3.5	1961	22%
	-									AEP_9_MSA_Canton-										
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24	543	PJM	Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	-467	7.3	4305	49%
										AEP_9_MSA_Canton-										
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,695	2,361	27.05	399	PJM	Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	-467	9.5	4503	51%
										AEP_9_MSA_Canton-										
PJM	NI_20_MSA_Chicago_G	7900	1,632	83	892	1,578	32.69	230	PJM	Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	-467	3.8	2086	24%
										AEP_9_MSA_Canton-										
	NIPS_8_MSA_Chicago_G	8692	2,892	1,694	817	1,465	32.55		PJM	Massillon_L	8760	733	2,120	-1,461	-2,211	36.51	-467	4.0	1193	14%
	NI_20_MSA_Chicago_G	7900	1,632	83	892	1,578	32.69			AMRN_12_MSA_StLouis_L	2475	5,059	6,066	-438	-1,792	36.48	-40	3.8	1398	16%
	MEC_3_MSA_DesMoines_G	8494 8712	3,307 2,479	1,933	636 1.695	1,436 2,361	20.61		MISO MISO	AMRN_12_MSA_StLouis_L	2475 2475	5,059	6,066 6,066	-438	-1,792	36.48 36.48	-40 -40	15.9	2977	34% 38%
PJM PJM	NI_15_MSA_Davenport_G NI 7 MSA Rochelle G	8712	2,479	0	2,119	2,361	27.05 29.24		MISO	AMRN_12_MSA_StLouis_L AMRN 12 MSA StLouis L	2475	5,059 5.059	6,066	-438 -438	-1,792 -1,792	36.48	-40 -40	9.4 7.2	3311 4187	38% 48%
	AECI 4 GEN NewMadrid1 G	8760	2,290	248	1,108	1,604	32.71		MISO	AMRN 12 MSA StLouis L	2475	5,059	6,066	-438	-1,792	36.48	-40	3.8	2207	25%
	NI_6_MSA_Chicago_G	7988	9,759	7,577	995	2.915	32.98		MISO	AMRN 12 MSA StLouis L	2475	5.059	6.066	-438	-1,792	36.48	-40	3.5	1856	21%
	NI_2_MSA_Chicago_G	8760	5,342	1,283	3,562	4,192	32.75	1,022		AMRN 12 MSA StLouis L	2475	5,059	6,066	-438	-1,792	36.48	-40	3.7	1832	21%
												·								
	CIN_8_MSA_Evansville_G	8760	3,657	260	2,521	3,388	33.40		MISO	AMRN_12_MSA_StLouis_L	2475	5,059	6,066	-438	-1,792	36.48	-40	3.1	6136	70%
	IP_7_GEN_Baldwin_G	8760	1,900	444	1,151	1,478	29.17		MISO	AMRN_12_MSA_StLouis_L	2475	5,059	6,066	-438	-1,792	36.48	-40	7.3	0	0%
	IP_8_GEN_Clinton_G	8009	2,302	1,195	927	1,213	31.99		MISO	AMRN_12_MSA_StLouis_L	2475	5,059	6,066	-438	-1,792	36.48	-40	4.5	492	6%
	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24		MISO	AMRN_2_County_Macon_L	8760	174	1,209	-720	-1,156	32.79	-207	3.5	5351	61%
	AMRN_12_MSA_StLouis_L	6285 8712	5,059 2,479	6,066	625 1.695	1,758 2,361	27.33 27.05		MISO MISO	AMRN_2_County_Macon_L AMRN_2_County_Macon_L	8760 8760	174 174	1,209 1,209	-720 -720	-1,156 -1.156	32.79 32.79	-207 -207	5.5 5.7	4660 4808	53%
	NI_15_MSA_Davenport_G IP 7 GEN Baldwin G	8712	1,900	444	1,695	1,478	27.05		MISO		8760	174	1,209	-720 -720	-1,156 -1,156	32.79	-207	3.6	4808 5263	55% 60%
	MEC 3 MSA DesMoines G	8494	3,307	1,933	1,151	1,478	29.17			AMRN_2_County_Macon_L AMRN_2_County_Macon_L	8760	174	1,209	-720 -720	-1,156	32.79	-207	12.2	5263	58%
	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,436	36.42			AP_2_GEN_Albright3_L	8760	603	1,748	-1,213	-1,748	37.49	-398	1.1	4094	47%
	AEP 8 GEN Amos01 G	8760	19,694	6,544	6,383	10,230	36.20	2,024		AP_2_GEN_Albright3_L	8760	603	1,748	-1,213	-1,748	37.49	-398	1.1	5794	66%
. 5	,0_0E11_/1/10301_0	3700	. 5,054	5,544	3,000	. 5,200	30.20	2,024		AP_7_MSA_Hagerstown-	0700	000	1,740	1,210	1,7 40	31.43	550	1.3	5134	00 /6
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	Martinsburg L	8760	203	1,153	-688	-1,101	44.37	-268	5.3	7460	85%
	gii_o_mon_, mosargii_o	3.30	.,. 30		.,	.,. 00	55.00	.02		AP_7_MSA_Hagerstown-	3.30	_00	.,.50	500	.,	5/		5.0	50	5570
MISO	FE 9 MSA Weirton G	8741	1,860	112	1,342	1,795	36.50	428	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	7.9	7753	88%
			,			,				AP_7_MSA_Hagerstown-			,						50	
MISO	FE_6_MSA_Pittsburgh_G	8592	2,371	213	1,964	2,290	36.50	616	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	7.9	7758	88%
										AP_7_MSA_Hagerstown-								i i		
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35	509	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	5.0	7447	85%
										AP_7_MSA_Hagerstown-										
PJM	VAP_1_MSA_Richmond_G	8760	10,524	3,579	3,424	6,047	43.27	1,298	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	1.1	4972	57%
										AP_7_MSA_Hagerstown-										
PJM	VAP_7_G	7408	4,179	303	1,507	3,608	41.18	460	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	3.2	5773	66%
										AP_7_MSA_Hagerstown-										
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81	889	PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	5.6	7492	85%
7		T	ΙΤ		I T					AP_7_MSA_Hagerstown-	ı T		I T		I T	T		ı .T	7	
PJM	AEP 8 GEN Amos01 G	8760	19,694	6.544	6,383	10,230	36.20	2,024	PJM	Martinsburg L	8760	203	1,153	-688	-1,101	44.37	-268	8.2	7947	90%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion In	dicators	$\overline{}$
					Average									Average				Ť		
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Lood	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Load Weight	(MW)	(MW)	(\$/MWh)	(\$MM)		J90 Hours	U90 %
					()	()	(4,)	(4)		AP_7_MSA_Hagerstown-	7.56.5		g	()	()	(4,)	(4)			
PJM	DLCO_7_MSA_Pittsburgh_G	8232	1,644	25	1,367	1,632	36.42		PJM	Martinsburg_L	8760	203	1,153	-688	-1,101	44.37	-268	8.0	7778	89%
PJM MISO	DLCO_7_MSA_Pittsburgh_G FE 6 MSA Pittsburgh G	8232 8592	1,644 2,371	25 213	1,367 1,964	1,632 2,290	36.42 36.50		PJM PJM	AP_8_MSA_DC-VA-MD_L AP 8 MSA DC-VA-MD L	8760 8760	0	1,097 1.097	-728 -728	-1,048 -1.048	44.81 44.81	-286 -286	8.4 8.3	7938 7908	90%
MISO	FE_9_MSA_Weirton_G	8741	1,860	112	1,342	1,795	36.50		PJM	AP 8 MSA DC-VA-MD_L	8760	0	1,097	-728	-1,048	44.81	-286	8.3	7897	90%
PJM	PJM500 3 MSA Pittsburgh G	8760	1,705	0	1,438	1,700	39.08		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	44.81	-286	5.7	7701	88%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	44.81	-286	6.0	7665	87%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20		PJM	AP_8_MSA_DC-VA-MD_L	8760	0	1,097	-728	-1,048	44.81	-286	8.6	7989	91%
PJM PJM	PJM500_9_MSA_Pittsburgh_G VAP 1 MSA Richmond G	8664 8760	1,700 10,524	3,579	1,492 3,424	1,700 6,047	39.35 43.27	509 1,298	PJM	AP_8_MSA_DC-VA-MD_L AP 8 MSA DC-VA-MD L	8760 8760	0	1,097 1,097	-728 -728	-1,048 -1,048	44.81 44.81	-286 -286	5.5 1.5	7695 4368	88% 50%
PJM	VAP_1_MSA_RICHMONU_G	7408	4,179	303	1,507	3,608	41.18		PJM	AP 8 MSA DC-VA-MD L	8760	0	1,097	-728	-1,048	44.81	-286	3.6	5923	67%
		7 100	1,170		1,007	0,000	11110	100		BGE_10_MSA_Baltimore-	0,00		1,007	720	1,010	11.01	200	0.0	- 0020	0.70
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35	509	PJM	Towson_L	8760	845	1,565	-485	-1,030	45.37	-193	6.0	7692	88%
										BGE_10_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	Towson_L BGE_5_MSA_Baltimore-	8760	845	1,565	-485	-1,030	45.37	-193	6.3	7733	88%
PJM	PJM500 9 MSA Pittsburgh G	8664	1,700	0	1,492	1,700	39.35	509	PJM	Towson_L	8760	263	1,462	-821	-1,495	45.25	-325	5.9	7691	88%
-	r emoco_o_mer_r mesargn_e		.,		.,	-,,,,,,				BGE_5_MSA_Baltimore-			.,		1,100				7001	- 0070
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	Towson_L	8760	263	1,462	-821	-1,495	45.25	-325	6.2	7736	88%
						. ===				BGE_9_MSA_Baltimore-										
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	Towson_L	8760	0	1,186	-690	-1,231	45.61	-276	6.5	7747	88%
PJM	PJM500 4 MSA Philadelphia G	8702	2,383	0	1,806	3,346	44.57	700	PJM	BGE_9_MSA_Baltimore- Towson L	8760	0	1,186	-690	-1,231	45.61	-276	1.0	7309	83%
	T CMICCO TIMES (IT TIME CONTINUE)	0,02	2,000		1,000	0,010	11.01	700		BGE_9_MSA_Baltimore-	0.00		1,100	000	1,201	10.01	2.0		- 1000	- 0070
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35		PJM	Towson_L	8760	0	1,186	-690	-1,231	45.61	-276	6.3	7715	88%
MISO	CIN_8_MSA_Evansville_G	8760	3,657	260	2,521	3,388	33.40		MISO	CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,268	-3,748	34.52	-686	1.1	3051	35%
MISO	NIPS_8_MSA_Chicago_G	8692	2,892	1,694	817	1,465	32.55	231		CIN_1_MSA_Indianapolis_L	8760	816	4,274	-2,268	-3,748	34.52	-686	2.0	1224	14%
MISO MISO	IPL_2_MSA_Jasper_G	8760 8760	1,678 2,000	225	1,417 1,554	1,664 1,900	33.29 33.05		MISO MISO	CIN_1_MSA_Indianapolis_L	8760 8760	816 816	4,274 4,274	-2,268 -2,268	-3,748 -3,748	34.52 34.52	-686 -686	1.2 1.5	3135 4711	36% 54%
MISO	LGEE_3_GEN_Gehnt2_G AMRN 12 MSA StLouis L	6285	5,059	6,066	625	1,758	27.33		MISO	CIN_1_MSA_Indianapolis_L CIN 1 MSA Indianapolis L	8760	816	4,274	-2,268	-3,748	34.52	-686	7.2	4567	52%
	7 WWW. 12_WO/O(20010_2	0200	0,000	0,000	020	1,700	27.00	101		CIN_4_MSA_Cincinnati-	0,00	0.0	1,271	2,200	0,7 10	0 1.02	000		- 1001	0270
MISO	EKPC_8_MSA_Maysville_G	8760	1,396	272	810	1,088	35.64		MISO	Middletown_G	6707	6,026	5,727	-643	-2,119	36.70	-158	1.1	498	6%
MISO	NIPS_8_MSA_Chicago_G	8692	2,892	1,694	817	1,465	32.55	231	MISO	CIN_7_MSA_Lafayette_L	8760	144	1,712	-884	-1,480	33.75	-261	1.2	960	11%
PJM VACAR	VAP_7_G	7408 7069	4,179 1,911	303	1,507	3,608 1,911	41.18 41.81		VACAR VACAR	CPLE_1_MSA_Durham_G CPLE 1 MSA Durham G	1223	10,224 10,224	8,563 8,563	-421 -421	-1,661 -1,661	43.41 43.41	-22	2.2 1.6	5404	62%
VACAR	DUK_5_MSA_Seneca_G DUK 9 MSA Charlotte G	8549	14,681	9,966	960 2,865	5,471	38.80		VACAR	CPLE_1_MSA_Durnam_G  CPLE 1 MSA Durham G	1223 1223	10,224	8,563	-421	-1,661	43.41	-22 -22	4.6	4432 600	50% 7%
VACAR	SCEG_1_MSA_Columbia_G	8403	4,954	2,752	1,121	2,595	40.37		VACAR	CPLE_1_MSA_Durham_G	1223	10,224	8,563	-421	-1,661	43.41	-22	3.0	2127	24%
VACAR	SCPSA 10 MSA Charleston G	8760	1,680	0	1,413	1,680	39.64		VACAR	CPLE_1_MSA_Durham_G	1223	10,224	8,563	-421	-1,661	43.41	-22	3.8	1892	22%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024	VACAR	CPLE_1_MSA_Durham_G	1223	10,224	8,563	-421	-1,661	43.41	-22	7.2	6719	76%
VACAR	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	2,865	5,471	38.80		VACAR	DUK_4_MSA_Greenville_L	7764	3,546	4,489	-649	-1,947	40.12	-202	1.3	25	0%
SOUTHERN SOUTHERN	SOCO_15_MSA_Birmingham_G SOCO_28_MSA_Birmingham_G	8553 8760	12,464 2,535	9,217 1,090	2,104 1,319	5,025 1,836	38.50 38.44	693 444	VACAR VACAR	DUK_4_MSA_Greenville_L DUK 4 MSA Greenville L	7764 7764	3,546 3,546	4,489 4,489	-649 -649	-1,947 -1,947	40.12 40.12	-202 -202	1.6 1.7	4035 4013	46% 46%
SOUTHERN	SOCO 31 MSA Atlanta G	8760	11,765	1,583	4,305	9,149	39.09	1.474		DUK 4 MSA Greenville L	7764	3,546	4,489	-649	-1,947	40.12	-202	1.0	1051	12%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60	194	VACAR	DUK_4_MSA_Greenville_L	7764	3,546	4,489	-649	-1,947	40.12	-202	1.5	4119	47%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024	VACAR	DUK_4_MSA_Greenville_L	7764	3,546	4,489	-649	-1,947	40.12	-202	3.9	5013	57%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024	VACAR	DUK_8_MSA_Charlotte_L	8760	1,407	4,886	-2,387	-4,010	39.32	-822	3.1	3953	45%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024	VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	-6	19.9	4230	48%
SOUTHERN VACAR	SOCO_32_MSA_Pascagoula_G CPLE 1 MSA Durham G	8204 7537	3,574 10,224	2,674 8,563	612 879	1,568 2,332	38.60 39.61	194 262	VACAR VACAR	DUK_9_MSA_Charlotte_G DUK 9 MSA Charlotte G	211 211	14,681 14,681	9,966 9,966	-483 -483	-2,130 -2,130	56.08 56.08	-6	17.5 16.5	2412 230	27% 3%
VACAR	DUK 5 MSA Seneca G	7069	1,911	0,505	960	1,911	41.81	284		DUK 9 MSA Charlotte G	211	14,681	9,966	-483	-2,130	56.08	-6	14.3	230 16	0%
VACAR	SCEG_1_MSA_Columbia_G	8403	4,954	2,752	1,121	2,595	40.37	380		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	-6	15.7	226	3%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50	693		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	-6	17.6	2472	28%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,102	6,381	39.15	1,750	VACAR	DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	-6	16.9	752	9%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,319	1,836	38.44	444		DUK_9_MSA_Charlotte_G	211	14,681	9,966	-483	-2,130	56.08	-6	17.6	2546	29%
SOUTHERN ENTERGY	SOCO_31_MSA_Atlanta_G EES 9 MSA Russellville G	8760 3149	11,765 6.123	1,583 4,517	4,305 202	9,149 1,008	39.09 30.95	1,474	VACAR ENTERGY	DUK_9_MSA_Charlotte_G EES 1 MSA Jackson L	211 8760	14,681 3,218	9,966 3,066	-483 -1,414	-2,130 -2,144	56.08 36.19	-6 -448	17.0 5.2	1243 2669	14% 30%
SPP	AEPW 5 MSA Tulsa G	7180	4,226	2,571	394	1,008	30.95		ENTERGY	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,414	-2,144	36.19	-448	5.4	2806	30%
SPP	AEPW_9_MSA_MountPleasant_0	7212	8,168	3,832	554	1,937	34.00		ENTERGY	EES_1_MSA_Jackson_L	8760	3,218	3,066	-1,414	-2,144	36.19	-448	2.2	8706	99%
													·							
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60	194	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	3.3	6911	79%
CDD	AEDM E MOA Tides C	7400	4 000	0.574	20.4	4 274	20.70		ENTEROY	EEC E MOA NamOrlana O	0700	0.705	0.004	0.050	F 450	44.00	4.040	44.4	7000	0007
SPP	AEPW_5_MSA_Tulsa_G	7180	4,226	2,571	394	1,371	30.78	87	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	11.1	7060	80%
ENTERGY	EES_7_MSA_Beaumont-PortArth	2674	7,393	4,949	326	1,504	39.85	35	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	2.0	6655	76%
COLITUED	COCO 24 MCA Alleria O	0700	44.70-	4.500	4.00=	0.440	00.00		ENTEROY	EEC E MOA Namodana C	0700	0.70-	0.00:	0.050	F 450	44.00	4.040	0.0	7400	0401
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09	1,4/4	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	2.8	7109	81%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion I	ndicators	
					Average			D						Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
SPP	CELE 10 MSA Alexandria G	8344	1.895	742	403	1,246	37.85	407	ENTERGY	EES 5 MSA NewOrleans G	8760	9.735	9,294	-2,859	-5.453	41.89	-1.049	4.0	6855	78%
SFF	CELE_TO_WSA_Alexandria_G	0344	1,093	142	403	1,240	37.00	121	ENTERGI	EE3_3_W3A_NewOffeatis_G	8700	9,733	9,294	-2,009	-5,455	41.09	-1,049	4.0	0000	76%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,102	6,381	39.15	1,750	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	2.7	7124	81%
ENTERGY	EES 8 MSA BatonRouge G	8496	1,060	0	1,059	1,060	36.11	325	ENTERGY	EES 5 MSA NewOrleans G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	5.8	5468	62%
													·							
ENTERGY	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	351	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	3.9	6656	76%
ENTERGY	EES 9 MSA Russellville G	3149	6,123	4,517	202	1,008	30.95	20	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	10.9	7036	80%
			0.544						ELITED 01/	=== =					- 4-0					
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	5.1	6691	76%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,347	1,726	36.14	426	ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	5.7	6651	76%
SOLITHEDN	SOCO 15 MSA Birmingham G	8553	12.464	9.217	2,104	5,025	38.50	603	ENTERGY	EES 5 MSA NewOrleans G	8760	9,735	9,294	-2.859	-5.453	41.89	-1,049	3.4	7091	81%
SOUTHLIN	3000_13_W3A_BiiTiilighaiti_0	0000	12,404	3,217	2,104	3,023	30.30	093	LIVILIOI	LLO_0_WOA_NewOneans_G	0700	3,733	3,234	-2,000	-5,455	41.03	-1,043	5.4	7031	0170
		8760	2,535	1,090	1,319	1,836	38.44		ENTERGY	EES_5_MSA_NewOrleans_G	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	3.5	7085	81%
SPP	AEPW_9_MSA_MountPleasant_0	7212	8,168	3,832	554	1,937	34.00	136	ENTERGY	EES_5_MSA_NewOrleans_G EES 7 MSA Beaumont-	8760	9,735	9,294	-2,859	-5,453	41.89	-1,049	7.9	8709	99%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	ENTERGY	PortArthur_G	6086	7,393	4,949	-446	-1,529	36.79	-100	5.8	6993	80%
SPP	AEPW_9_MSA_MountPleasant_0	7212	8,168	3,832	554	1,937	34.00	136	ENTERGY	EES_7_MSA_Beaumont-PortA	6086	7,393	4,949	-446	-1,529	36.79	-100	2.8	8707	99%
SPP	AFDW 5 MCA Tules C	7180	4,226	2,571	394	1,371	30.78	87	ENTERGY	EES_7_MSA_Beaumont-	6086	7,393	4.949	-446	-1,529	36.79	-100	6.0	4070	400/
TVAUTHOR	AEPW_5_MSA_Tulsa_G TVA 4 MSA Clarksville G	8592	2,544	150	2,119	2,480	35.64	649		PortArthur_G EES 9 MSA Russellville G	5611	6,123	4,949	-446	-2,048	37.81	-100	2.2	4079 2181	46% 25%
TVAUTHOR	TVA 1 MSA Chatt-Hunts G	8756	17,334	9,966	3,234	7,588	35.75	1,012	ENTERGY	EES 9 MSA Russellville G	5611	6,123	4,517	-452	-2,048	37.81	-96	2.1	1112	13%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	ENTERGY	EES_9_MSA_Russellville_G	5611	6,123	4,517	-452	-2,048	37.81	-96	1.0	0	0%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	2,199	163	1,347	1,726	36.14	426	ENTERGY	EES_9_MSA_Russellville_G	5611	6,123	4,517	-452	-2,048	37.81	-96	1.7	0	0%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2,315	248	1,108	1,604	32.71		ENTERGY	EES_9_MSA_Russellville_G	5611	6,123	4,517	-452	-2,048	37.81	-96	5.1	2816	32%
ENTERGY SPP	EES_2_MSA_Batesville_G AEPW 9 MSA MountPleasant 0	8743 7212	3,525 8,168	1,697 3,832	1,929 554	2,737 1.937	34.97 34.00		ENTERGY ENTERGY	EES_9_MSA_Russellville_G EES 9 MSA Russellville G	5611 5611	6,123 6,123	4,517 4,517	-452 -452	-2,048 -2.048	37.81 37.81	-96 -96	2.8 3.8	1775 8707	20%
SPP	AEPW_9_MSA_MountPleasant_0 AEPW_5_MSA_Tulsa_G	7212	4,226	2,571	394	1,937	30.78		ENTERGY	EES 9 MSA Russellville G	5611	6,123	4,517	-452 -452	-2,048	37.81	-96 -96	7.0	280	99%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10.230	36.20	-		FE_5_MSA_Cleveland_L	8355	3,216	4,680	-655	-2,731	37.30	-204	1.1	4706	54%
SOUTHERN	SOCO 26 MSA Macon G	8760	6,802	0	5,102	6,381	39.15	1,750	FRCC	FPC 3 MSA Orlando L	8760	1,232	3,649	-2,010	-3,708	42.85	-754	3.7	4002	46%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50	693		FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,010	-3,708	42.85	-754	4.3	4006	46%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60		FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,010	-3,708	42.85	-754	4.2	4183	48%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09		FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,010	-3,708	42.85	-754	3.8	4017	46%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,319	1,836	38.44		FRCC	FPC_3_MSA_Orlando_L	8760	1,232	3,649	-2,010	-3,708	42.85	-754	4.4 4.8	4010	46%
SOUTHERN	SOCO_32_MSA_Pascagoula_G SOCO_26_MSA_Macon_G	8204 8760	3,574 6,802	2,674	612 5,102	1,568 6.381	38.60 39.15		FRCC FRCC	FPC_4_MSA_Tampa_L FPC_4_MSA_Tampa_L	8760 8760	2,239	2,873 2,873	-1,541 -1,541	-2,620 -2,620	43.37 43.37	-586 -586	4.8	4487 4350	51% 50%
SOUTHERN	SOCO 28 MSA Birmingham G	8760	2,535	1.090	1,319	1,836	38.44		FRCC	FPC 4 MSA Tampa L	8760	2,239	2,873	-1,541	-2,620	43.37	-586	4.2	4354	50%
SOUTHERN	SOCO 15 MSA Birmingham G	8553	12,464	9,217	2.104	5.025	38.50		FRCC	FPC 4 MSA Tampa L	8760	2,239	2,873	-1.541	-2,620	43.37	-586	4.9	4353	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09		FRCC	FPC_4_MSA_Tampa_L	8760	2,239	2,873	-1,541	-2,620	43.37	-586	4.3	4352	50%
FRCC	FPC_2_MSA_HomosassaSprings	8544	1,584	0	1,359	1,584	42.67	496	FRCC	FPL_2_MSA_FortMyers_G	8680	5,929	4,563	-1,236	-2,761	43.91	-471	1.2	5035	57%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50		FRCC	FPL_2_MSA_FortMyers_G	8680	5,929	4,563	-1,236	-2,761	43.91	-471	5.4	4773	54%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,102	6,381	39.15	1,750		FPL_2_MSA_FortMyers_G	8680	5,929	4,563	-1,236	-2,761	43.91	-471	4.8	4764	54%
SOUTHERN	SOCO_31_MSA_Atlanta_G SOCO_28_MSA_Birmingham_G	8760 8760	11,765 2.535	1,583 1,090	4,305 1,319	9,149 1,836	39.09 38.44		FRCC FRCC	FPL_2_MSA_FortMyers_G FPL_2_MSA_FortMyers_G	8680 8680	5,929 5,929	4,563 4,563	-1,236 -1,236	-2,761 -2,761	43.91 43.91	-471 -471	4.8 5.5	4769 4774	54% 54%
SOUTHERN		8204	3,574	2,674	612	1,568	38.60		FRCC	FPL_2_MSA_FortMyers_G	8680	5,929	4,563	-1,236	-2,761	43.91	-471	5.3	4890	56%
FRCC	FPC_2_MSA_HomosassaSprings	8544	1,584	2,074	1,359	1,584	42.67		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	-845	1.5	5120	58%
	SOCO_28_MSA_Birmingham_G		2,535	1,090	1,319	1,836	38.44		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	-845	5.8	4680	53%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50	693	FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	-845	5.7	4680	53%
SOUTHERN		8760	6,802	0	5,102	6,381	39.15		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	-845	5.1	4671	53%
FRCC	SEC_6_MSA_Palatka_G	8760	1,330	0	1,128	1,330	43.19		FRCC	FPL_3_MSA_Miami_L	8760	6,944	7,089	-2,181	-4,279	44.20	-845	1.0	4854	55%
SOUTHERN		8204 8760	3,574 11,765	2,674	612	1,568	38.60 39.09		FRCC	FPL_3_MSA_Miami_L	8760 8760	6,944 6,944	7,089	-2,181	-4,279	44.20 44.20	-845	5.6	4791	55%
SOUTHERN SOUTHERN		8760 8204	3,574	1,583 2,674	4,305 612	9,149 1,568	39.09		FRCC FRCC	FPL_3_MSA_Miami_L FPL 7 MSA Miami L	8760 8760	6,944 570	7,089 3,923	-2,181 -2,635	-4,279 -4,256	44.20	-845 -1,019	5.1 5.6	4673 4820	53% 55%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	2,074	5,102	6,381	39.15		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,635	-4,256	44.17	-1,019	5.0	4707	54%
SOUTHERN	SOCO 28 MSA Birmingham G	8760	2,535	1,090	1,319	1,836	38.44		FRCC	FPL 7 MSA Miami L	8760	570	3,923	-2,635	-4,256	44.17	-1,019	5.7	4716	54%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,635	-4,256	44.17	-1,019	5.1	4710	54%
FRCC	FPC_2_MSA_HomosassaSprings	8544	1,584	0	1,359	1,584	42.67		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,635	-4,256	44.17	-1,019	1.5	5182	59%
SOUTHERN		8553	12,464	9,217	2,104	5,025	38.50		FRCC	FPL_7_MSA_Miami_L	8760	570	3,923	-2,635	-4,256	44.17	-1,019	5.7	4714	54%
MISO	XEL_3_MSA_Minneapolis_G	2949	7,596	7,622	585	1,604	17.49		MISO	GRE_4_MSA_Minneapolis_L	8760	331	1,111	-1,099	-2,103	27.93	-269	10.4	6	0%
MISO NYPP	ITC_7_MSA_Monroe_G	8472 7592	1,500 1,206	681	1,344 664	1,500 1,392	36.59 22.34		ONTARIO ONTARIO	IESO_11_G	8760 8760	9,529 9,529	12,779	-3,037	-7,371	38.29 38.29	-1,019 -1,019	1.7	5943 8087	68% 92%
MISO	NYISO_4_NYD ITC_3_MSA_Detroit_G	7592 8744	3,815	1,600	1,221	2,005	36.98		ONTARIO	IESO_11_G IESO_11_G	8760	9,529	12,779 12,779	-3,037 -3,037	-7,371 -7,371	38.29	-1,019	16.0 1.3	7608	92% 87%
NYPP	NYISO 4 NYD	7592	1,206	681	664	1,392	22.34		ONTARIO	IESO 15 G	8760	1,964	3,375	-2,360	-3,239	38.16	-789	15.8	8087	92%
		1002	1,200	001	004	.,002	-2.04	113		1	0,00	1,004	5,575	2,000	5,205	50.10	703	10.0	0007	JZ /6

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion In	dicators	
					Average									Average						
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential L	I90 Hours	U90 %
MISO	ITC_3_MSA_Detroit_G	8744	3,815	1,600	1,221	2,005	36.98		ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	38.16	-789	1.2	7005	80%
MISO	ITC_7_MSA_Monroe_G	8472	1,500	0	1,344	1,500	36.59		ONTARIO	IESO_15_G	8760	1,964	3,375	-2,360	-3,239	38.16	-789	1.6	5771	66%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		ONTARIO	IESO_2_G	6738	2,437	2,116	-584	-1,367	36.70	-144	14.4	8222	94%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		ONTARIO	IESO_3_L	8760	39	1,696	-1,181	-1,636	37.51	-388	15.2	8090	92%
MISO	IPL_2_MSA_Jasper_G CIN 8 MSA Evansville G	8760 8760	1,678 3.657	260	1,417 2,521	1,664 3,388	33.29 33.40		MISO MISO	IPL_5_MSA_Indianapolis_L IPL 5 MSA Indianapolis L	8760 8760	306 306	1,187 1,187	-783 -783	-1,258 -1,258	34.68 34.68	-238 -238	1.4	2888 6004	33% 68%
MISO	IPL 2 MSA Jasper G	8760	1,678	200	1,417	1,664	33.29		MISO	IPL 8 MSA Indianapolis L	8760	547	1,107	-539	-1,236	34.73	-164	1.4	2944	34%
MISO	CIN 8 MSA Evansville G	8760	3,657	260	2,521	3,388	33.40		MISO	IPL 8 MSA Indianapolis L	8760	547	1,227	-539	-1,094	34.73	-164	1.3	6099	69%
SPP	WERE_1_MSA_Manhattan_G	8145	2,988	409	1,217	2,299	29.25		SPP	KACP_7_MSA_KansasCity_L	8760	0	1,291	-730	-1,422	32.74	-209	3.5	893	10%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	909	1,388	30.66	239	MISO	METC_8_MSA_BayCity_G	8013	3,795	2,562	-588	-1,639	37.13	-175	6.5	5238	60%
MISO	WEC 1 MSA Chicago G	8592	1,728	303	909	1,388	30.66	230	MISO	METC 9 MSA Kalamazoo L	8760	118	1.334	-819	-1,476	36.73	-263	6.1	4717	54%
NYPP	NYISO 1 NYA	8298	4.946	2.500	1,639	2,336	38.71		NEPOOL	NEPOOL 10 RI	6733	2.062	2.203	-422	-1,198	43.22	-123	4.5	6038	69%
NYPP	NYISO 3 NYC	8760	6,711	2,657	1,909	3,259	41.23		NEPOOL	NEPOOL 10 RI	6733	2,062	2,203	-422	-1,198	43.22	-123	2.0	8758	100%
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43	43	NEPOOL	NEPOOL_10_RI	6733	2,062	2,203	-422	-1,198	43.22	-123	2.8	6752	77%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		NEPOOL	NEPOOL_10_RI	6733	2,062	2,203	-422	-1,198	43.22	-123	20.9	8757	100%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		NEPOOL	NEPOOL_3_ME	4928	3,494	2,522	-245	-1,068	37.93	-46	15.6	8605	98%
NEPOOL NYPP	NEPOOL_2_NH	8300 7592	4,204	2,621 681	857 664	1,787	42.24 22.34		NEPOOL NEPOOL	NEPOOL_4_NEBOS NEPOOL 4 NEBOS	8717 8717	3,262	5,904	-1,487 -1.487	-3,459 -3,459	43.61 43.61	-565	1.4 21.3	6761	77%
NYPP	NYISO_4_NYD NYISO 3 NYC	8760	1,206 6,711	2,657	1,909	1,392 3,259	41.23		NEPOOL	NEPOOL_4_NEBOS	8717	3,262 3,262	5,904 5,904	-1,467	-3,459	43.61	-565 -565	2.4	8611 8758	98% 100%
NYPP	NYISO 1 NYA	8298	4.946	2,500	1,639	2,336	38.71		NEPOOL	NEPOOL 4 NEBOS	8717	3,262	5,904	-1,487	-3,459	43.61	-565	4.9	6038	69%
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43		NEPOOL	NEPOOL_4_NEBOS	8717	3,262	5,904	-1,487	-3,459	43.61	-565	3.2	6769	77%
NEPOOL	NEPOOL_2_NH	8300	4,204	2,621	857	1,787	42.24	300	NEPOOL	NEPOOL_6_WCMA	8556	4,285	3,417	-1,011	-3,114	43.71	-378	1.5	6912	79%
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43	43	NEPOOL	NEPOOL_6_WCMA	8556	4,285	3,417	-1,011	-3,114	43.71	-378	3.3	6900	79%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113	NEPOOL	NEPOOL_6_WCMA	8556	4,285	3,417	-1,011	-3,114	43.71	-378	21.4	8611	98%
NYPP NYPP	NYISO_3_NYC NYISO 1 NYA	8760 8298	6,711 4,946	2,657 2,500	1,909 1,639	3,259 2,336	41.23 38.71	526	NEPOOL NEPOOL	NEPOOL_6_WCMA NEPOOL 6 WCMA	8556 8556	4,285 4,285	3,417 3,417	-1,011 -1,011	-3,114 -3,114	43.71 43.71	-378 -378	2.5 5.0	8578 6043	98% 69%
NEPOOL	NEPOOL 2 NH	8300	4,204	2,500	857	1.787	42.24			NEPOOL 7 CT	1734	4,203	3,920	-374	-1.741	46.62	-30	4.4	7608	87%
NYPP	NYISO 4 NYD	7592	1,206	681	664	1,392	22.34	113		NEPOOL 7 CT	1734	4,447	3,920	-374	-1.741	46.62	-30	24.3	8759	100%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90	206	NEPOOL	NEPOOL_7_CT	1734	4,447	3,920	-374	-1,741	46.62	-30	3.7	8756	100%
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71		NEPOOL	NEPOOL_7_CT	1734	4,447	3,920	-374	-1,741	46.62	-30	7.9	6043	69%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,909	3,259	41.23		NEPOOL	NEPOOL_7_CT	1734	4,447	3,920	-374	-1,741	46.62	-30	5.4	8758	100%
NEPOOL NEPOOL	NEPOOL 3 ME	8757 3832	6,454 3,494	3,978 2,522	1,898	3,583 1,070	43.66 40.43		NEPOOL NEPOOL	NEPOOL_7_CT	1734 1734	4,447 4,447	3,920	-374	-1,741 -1,741	46.62 46.62	-30	3.0 6.2	2790 7583	32% 86%
NYPP	NEPOOL_3_ME NYISO_8_NYH	8760	2,021	973	277 1,570	1,070	45.29		NEPOOL	NEPOOL_7_CT NEPOOL 7 CT	1734	4,447	3,920 3,920	-374 -374	-1,741	46.62	-30 -30	1.3	8754	100%
NYPP	NYISO_6_NYF	7760	4,103		619	2,031	42.90		NEPOOL	NEPOOL 9 NWKST	8760	405	1,524	-729	-1,217	44.85	-287	2.0	8760	100%
NEPOOL	NEPOOL_5_SEMA	8757	6,454	3,978	1,898	3,583	43.66		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-729	-1,217	44.85	-287	1.2	8759	100%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-729	-1,217	44.85	-287	22.5	8760	100%
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-729	-1,217	44.85	-287	4.4	8758	100%
NYPP NEPOOL	NYISO_1_NYA NEPOOL 2 NH	8298 8300	4,946 4,204	2,500 2,621	1,639 857	2,336 1,787	38.71 42.24		NEPOOL NEPOOL	NEPOOL_9_NWKST NEPOOL 9 NWKST	8760 8760	405 405	1,524 1,524	-729 -729	-1,217 -1,217	44.85 44.85	-287 -287	6.1 2.6	6047 8759	69% 100%
NYPP	NYISO 3 NYC	8760	6.711	2,621	1.909	3,259	41.23		NEPOOL	NEPOOL_9_NWKST	8760	405	1,524	-729	-1,217	44.85	-287	3.6	8760	100%
PJM	NI 15 MSA Davenport G	8712	2,479	2,007	1,695	2,361	27.05		PJM	NI 13 MSA Chicago L	8760	2.396	10.556	-5.418	-9.590	32.65	-1.550	5.6	3352	38%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,418	-9,590	32.65	-1,550	3.4	3339	38%
MISO	WEC_1_MSA_Chicago_G	8592	1,728	303	909	1,388	30.66		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,418	-9,590	32.65	-1,550	2.0	4176	48%
MISO	ALTE_2_MSA_Madison_G	8746	1,665	441	491	1,061	27.05		PJM	NI_13_MSA_Chicago_L	8760	2,396	10,556	-5,418	-9,590	32.65	-1,550	5.6	5204	59%
MISO MISO	AMRN_12_MSA_StLouis_L	6285 8746	5,059 1,665	6,066 441	625 491	1,758 1,061	27.33 27.05		PJM PJM	NI_13_MSA_Chicago_L	8760 8760	2,396	10,556	-5,418 -638	-9,590 -1.267	32.65 32.55	-1,550 -182	5.3 5.5	6674	76%
MISO	ALTE_2_MSA_Madison_G WEC_1_MSA_Chicago_G	8746 8592	1,728	303	909	1,061	30.66		PJM	NI_3_MSA_Chicago_L NI_3_MSA_Chicago_L	8760	26 26	1,205 1,205	-638	-1,267 -1,267	32.55	-182 -182	1.9	5204 3825	59% 44%
PJM	NI_15_MSA_Davenport_G	8712	2,479		1,695	2,361	27.05		PJM	NI_3_MSA_Chicago_L	8760	26		-638	-1,267	32.55	-182	5.5	3369	38%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24		PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	32.55	-182	3.3	3369	38%
MISO	AMRN_12_MSA_StLouis_L	6285	5,059	6,066	625	1,758	27.33	107	PJM	NI_3_MSA_Chicago_L	8760	26	1,205	-638	-1,267	32.55	-182	5.2	6630	75%
PJM	NI_15_MSA_Davenport_G	8712	2,479	0	1,695	2,361	27.05		PJM	NI_6_MSA_Chicago_G	772	9,759	7,577	-275	-1,210	31.89	-7	4.8	3363	38%
PJM	NI_7_MSA_Rochelle_G	8760	2,290	0	2,119	2,290	29.24		PJM	NI_6_MSA_Chicago_G	772	9,759	7,577	-275	-1,210	31.89	-7	2.7	3402	39%
MISO	AMRN_12_MSA_StLouis_L WEC 1 MSA Chicago G	6285 8592	5,059 1,728	6,066 303	625 909	1,758 1,388	27.33 30.66		PJM PJM	NI_6_MSA_Chicago_G	772 772	9,759 9,759	7,577 7,577	-275 -275	-1,210 -1,210	31.89 31.89	-7 -7	4.6 1.2	6668 4173	76% 48%
MISO	ALTE 2 MSA Madison G	8746	1,728	441	491	1,061	27.05		PJM	NI_6_MSA_Chicago_G NI 6 MSA Chicago G	772	9,759	7,577	-275	-1,210	31.89	-7	4.8	4782	54%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		NYPP	NYISO_1_NYA	462	4,946	2,500	-307	-1,263	33.50	-5	11.2	8081	92%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	24.1	8759	100%
NEPOOL	NEPOOL_7_CT	7026	4,447	3,920	609	1,685	43.97		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	2.5	8759	100%
NEPOOL	NEPOOL_3_ME	3832	3,494	2,522	277	1,070	40.43		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	6.0	8760	100%
NEPOOL NYPP	NEPOOL_2_NH	8300 8760	4,204	2,621	857	1,787	42.24 45.29		NYPP NYPP	NYISO_10_NYJ	8760 8760	10,283	11,493 11,493	-3,442 -3,442	-5,433	46.46 46.46	-1,401	4.2 1.2	8760	100%
NEPOOL	NYISO_8_NYH NEPOOL_5_SEMA	8760 8757	2,021 6,454	973 3,978	1,570 1,898	1,958 3,583	45.29 43.66		NYPP	NYISO_10_NYJ NYISO_10_NYJ	8760 8760	10,283 10,283	11,493	-3,442	-5,433 -5,433	46.46	-1,401 -1,401	2.8	8758 8760	100% 100%
ONTARIO	IESO_6_G	8760	2,146		2,493	2,787	38.03		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	8.4	8760	100%
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	7.8	8759	100%
-			,	,	,	,						., .,	,	-, -				- 1		

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub I	nformation								Sink Hub Info	ormation								Congestion In	ndicators	
					Average									Average				July		
		Causas	C	Land	net	Max net	Average	Revenue			Cint	C	Lood	net	Max net	Average	Revenue	Deina		
Market Area	Hub Name	Source Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Market Area	Hub Nama	Sink Hours	Gen Weight	Load Weight	injection (MW)	injection (MW)	Price (\$/MWh)	surplus (\$MM)	Price Differential	U90 Hours	U90 %
	IESO 7 G	8760	2,953	253	2.506	2.829	38.04		NYPP	NYISO 10 NYJ	8760	10.283	11,493	-3.442	-5,433	46.46	-1.401	8.4	8759	100%
NYPP	NYISO 3 NYC	8760	6,711	2,657	1,909	3,259	41.23		NYPP	NYISO 10 NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	5.2	8760	100%
PJM	PENELEC_2_MSA_DuBois_G	8368	2,724	1,196	670	1,568	40.01	224	NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	6.5	6039	69%
ONTARIO	IESO_2_G	2022	2,437	2,116	295	1,032	42.49		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	4.0	8760	100%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90		NYPP	NYISO_10_NYJ	8760	10,283	11,493	-3,442	-5,433	46.46	-1,401	3.6	8760	100%
NEPOOL NYPP	NEPOOL_5_SEMA NYISO 3 NYC	8757 8760	6,454 6,711	3,978 2,657	1,898 1,909	3,583 3,259	43.66 41.23		NYPP NYPP	NYISO_11_NYK NYISO 11 NYK	8760 8760	5,681 5,681	5,289 5,289	-1,920 -1,920	-2,796 -2,796	47.02 47.02	-791 -791	3.4 5.8	8760 8760	100% 100%
NEPOOL	NEPOOL 3 ME	3832	3,494	2,522	277	1,070	40.43		NYPP	NYISO_TI_NTK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	6.6	8760	100%
ONTARIO	IESO 2 G	2022	2,437	2,116	295	1,032	42.49		NYPP	NYISO 11 NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	4.5	6040	69%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113	NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	24.7	8760	100%
NEPOOL	NEPOOL_7_CT	7026	4,447	3,920	609	1,685	43.97		NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	3.1	8760	100%
NYPP	NYISO_8_NYH	8760	2,021	973	1,570	1,958	45.29		NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	1.7	8756	100%
NEPOOL	NEPOOL_2_NH	8300 8298	4,204 4,946	2,621 2,500	857	1,787	42.24 38.71		NYPP	NYISO_11_NYK	8760 8760	5,681	5,289	-1,920	-2,796 -2,796	47.02 47.02	-791 -791	4.8	8760	100%
NYPP PJM	NYISO_1_NYA PENELEC_2_MSA_DuBois_G	8368	2,724	1,196	1,639 670	2,336 1,568	40.01		NYPP NYPP	NYISO_11_NYK NYISO_11_NYK	8760	5,681 5,681	5,289 5,289	-1,920 -1,920	-2,796	47.02	-791	8.3 7.0	6040 6040	69% 69%
ONTARIO	IESO_7_G	8760	2,953	253	2,506	2,829	38.04		NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	9.0	6040	69%
NYPP	NYISO 6 NYF	7760	4,103	1,983	619	2,031	42.90		NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	4.1	8760	100%
ONTARIO	IESO_6_G	8760	2,146	147	2,493	2,787	38.03		NYPP	NYISO_11_NYK	8760	5,681	5,289	-1,920	-2,796	47.02	-791	9.0	6040	69%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113		NYISO_2_NYB	8760	650	1,759	-732	-1,245	38.27	-246	15.9	7958	91%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113		NYISO_6_NYF	1000	4,103	1,983	-232	-1,044	37.45	-9	15.1	8632	98%
NEPOOL PJM	NEPOOL_3_ME PENELEC 2 MSA DuBois G	3832 8368	3,494 2,724	2,522 1,196	277 670	1,070 1,568	40.43 40.01	43 224	NYPP NYPP	NYISO_7_NYG NYISO 7 NYG	8191 8191	3,156 3,156	2,195 2,195	-811 -811	-1,818 -1.818	43.82 43.82	-291 -291	3.4 3.8	5819 5983	66% 68%
NEPOOL	NEPOOL 2 NH	8300	4,204	2,621	857	1,787	42.24	300		NYISO_7_NYG	8191	3,156	2,195	-811	-1,616	43.82	-291	1.6	6368	72%
NYPP	NYISO 3 NYC	8760	6,711	2,657	1,909	3,259	41.23	690		NYISO 7 NYG	8191	3,156	2,195	-811	-1,818	43.82	-291	2.6	5530	63%
NYPP	NYISO 4 NYD	7592	1,206	681	664	1,392	22.34		NYPP	NYISO 7 NYG	8191	3,156	2,195	-811	-1,818	43.82	-291	21.5	5757	66%
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71	526	NYPP	NYISO_7_NYG	8191	3,156	2,195	-811	-1,818	43.82	-291	5.1	5925	67%
ONTARIO	IESO_7_G	8760	2,953	253	2,506	2,829	38.04		NYPP	NYISO_7_NYG	8191	3,156	2,195	-811	-1,818	43.82	-291	5.8	6005	68%
ONTARIO	IESO_2_G	2022	2,437	2,116	295	1,032	42.49		NYPP	NYISO_7_NYG	8191	3,156	2,195	-811	-1,818	43.82	-291	1.3	6017	68%
ONTARIO NYPP	IESO_6_G NYISO 1 NYA	8760 8298	2,146 4,946	147	2,493 1.639	2,787 2.336	38.03 38.71		NYPP NYPP	NYISO_7_NYG	8191 8288	3,156	2,195 1,476	-811 -845	-1,818 -2,165	43.82 45.93	-291 3 -322	5.8 7.2	6005 5996	68% 68%
NYPP	NYISO_1_NYA NYISO 4 NYD	7592	1,206	2,500 681	1,639	1,392	22.34		NYPP	NYISO_9_NYI NYISO 9 NYI	8288	2	1,476	-845 -845	-2,165 -2,165	45.93 45.93	-322	23.6	8733	99%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2.031	42.90		NYPP	NYISO 9 NYI	8288	2	1,476	-845	-2,165	45.93	-322	3.0	8596	98%
NEPOOL	NEPOOL 2 NH	8300	4,204	2,621	857	1,787	42.24		NYPP	NYISO 9 NYI	8288	2	1,476	-845	-2,165	45.93	-322	3.7	8731	99%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,909	3,259	41.23		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	45.93	-322	4.7	8671	99%
NEPOOL	NEPOOL_5_SEMA	8757	6,454	3,978	1,898	3,583	43.66		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	45.93	-322	2.3	8602	98%
PJM	PENELEC_2_MSA_DuBois_G	8368	2,724	1,196	670	1,568	40.01		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	45.93	-322	5.9	5987	68%
NEPOOL	NEPOOL_7_CT	7026	4,447	3,920	609	1,685	43.97		NYPP	NYISO_9_NYI	8288 8288	2	1,476	-845	-2,165	45.93		2.0	8512	97%
NEPOOL ONTARIO	NEPOOL_3_ME IESO 7 G	3832 8760	3,494 2,953	2,522 253	277 2,506	1,070 2,829	40.43 38.04		NYPP NYPP	NYISO_9_NYI NYISO 9 NYI	8288	2	1,476 1,476	-845 -845	-2,165 -2,165	45.93 45.93	-322 3 -322	5.5 7.9	8730 6021	99% 69%
ONTARIO	IESO 6 G	8760	2,146	147		2,787	38.03		NYPP	NYISO 9 NYI	8288	2	1,476	-845	-2,165	45.93	-322	7.9	6021	69%
ONTARIO	IESO_2_G	2022	2,437	2,116	295	1,032	42.49		NYPP	NYISO_9_NYI	8288	2	1,476	-845	-2,165	45.93	-322	3.4	6022	69%
										OKGE_4_MSA_OklahomaCity										
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	SPP	L	8719	2,102	2,403	-773	-1,677	45.80	-309	14.9	7130	81%
ENTEROY	EEO O MOA Deterrible O	0740	0.505	4.007	4 000	0.707	04.07	500	ODD	OKGE_4_MSA_OklahomaCity	0740	0.400	0.400	770	4.077	45.00		40.0	7570	000/
ENTERGY	EES_2_MSA_Batesville_G	8743	3,525	1,697	1,929	2,737	34.97	590	SPP	_L OKGE 4 MSA OklahomaCity	8719	2,102	2,403	-773	-1,677	45.80	-309	10.8	7579	86%
SPP	AEPW 5 MSA Tulsa G	7180	4.226	2.571	394	1.371	30.78	87	SPP	I	8719	2.102	2.403	-773	-1.677	45.80	-309	15.0	6322	72%
O	7.E. 11_0_M67_14.64_6	7.00	1,220	2,011		1,071	00.70			OKGE_4_MSA_OklahomaCity	07.10	2,102	2,100		1,011	10.00		10.0	OOLL	1270
SPP	WERE_1_MSA_Manhattan_G	8145	2,988	409	1,217	2,299	29.25	290	SPP	_L	8719	2,102	2,403	-773	-1,677	45.80	-309	16.5	8397	96%
										OKGE_4_MSA_OklahomaCity										
SPP	AEPW_9_MSA_MountPleasant_0	7212	8,168	3,832	554	1,937	34.00		SPP	L	8719	2,102	2,403	-773	-1,677	45.80	-309	11.8	6538	74%
MAPP	NPPD_4_GEN_Gentleman_G	8235	2,702	148	790	1,472	13.70	89	MAPP	OPPD_5_MSA_Omaha_L	8760	480	1,686	-855	-1,549	19.83	-148	6.1	7769	88%
PJM	PJM500_7_MSA_York-Hanover_	8760	2,696		2,072	2,570	44.70	044	PJM	DECO E MCA Dhiladalahia I	7264	1,656	2,510	-413	-2,388	46.84	-141	2.1	977	11%
PJIVI	PJW500_7_WSA_fork-manover_	8760	2,090	U	2,072	2,570	44.70	011	PJIVI	PECO_5_MSA_Philadelphia_L	7204	1,000	2,510	-413	-2,300	40.04	-141	2.1	9//	11%
РЈМ	PJM500 4 MSA Philadelphia G	8702	2.383	0	1,806	3,346	44.57	700	PJM	PECO 5 MSA Philadelphia L	7264	1,656	2,510	-413	-2,388	46.84	-141	2.3	0	0%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81		PJM	PEPCO_1_MSA_DC_L	8760	0	1,439	-883	-1,547	45.47		6.7	7511	86%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	PEPCO_1_MSA_DC_L	8760	0	1,439	-883	-1,547	45.47	-352	6.4	7514	86%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35		PJM	PEPCO_1_MSA_DC_L	8760	0	1,439	-883	-1,547	45.47		6.1	7503	85%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08		PJM	PL_5_MSA_Lancaster_L	8760	0	897	-721	-1,027	44.34	-280	5.3	7044	80%
PJM PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700 2,724	0 1,196	1,492	1,700	39.35		PJM	PL_5_MSA_Lancaster_L	8760	0	897	-721 721	-1,027	44.34 44.34	-280	5.0	5819	66% 84%
PJM	PENELEC_2_MSA_DuBois_G PJM500 3 MSA Pittsburgh G	8368 8760	1,705	1,196	670 1,438	1,568 1,700	40.01 39.08		PJM PJM	PL_5_MSA_Lancaster_L PL 7 MSA Allentown L	8760 8760	245	897 1,051	-721 -697	-1,027 -1,038	44.34	-280 -269	4.3 5.1	7397 8234	94%
PJM	PENELEC 2 MSA DuBois G	8368	2,724	1,196	670	1,768	40.01		PJM	PL 7 MSA Allentown L	8760	245	1,051	-697	-1,038	44.15	-269	4.1	7335	84%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35		PJM	PL_7_MSA_Allentown_L	8760	245	1,051	-697	-1,038	44.15	-269	4.8	7379	84%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,909	3,259	41.23	690	PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-908	-2,093	44.40	-353	3.2	8194	93%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113	PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-908	-2,093	44.40	-353	22.1	8338	95%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub Ir	formation								Sink Hub Info	rmation								Congestion	Indicators	
					Average	May not	A	Davission						Average	Maynat	A.,	Davisson			
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71		PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-908	-2,093	44.40	-353	5.7	8174	93%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90		PJM	PSEG_3_MSA_NewYork_L	8760	1,843	2,275	-908	-2,093	44.40	-353	1.5	8206	93%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34	113	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,281	-2,060	44.73	-502	22.4	8330	95%
NYPP	NYISO_3_NYC	8760	6,711	2,657	1,909	3,259	41.23	690	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,281	-2,060	44.73	-502	3.5	7891	90%
NYPP	NYISO_1_NYA	8298	4,946	2,500	1,639	2,336	38.71	526	PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,281	-2,060	44.73	-502	6.0	8152	93%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90		PJM	PSEG_5_MSA_Philadelphia_L	8760	2,143	2,766	-1,281	-2,060	44.73	-502	1.8	8260	94%
NYPP	NYISO_6_NYF	7760	4,103	1,983	619	2,031	42.90		PJM	PSEG_8_MSA_NewYork_G	8758	3,860	3,654	-1,146	-2,500	44.40	-446	1.5	8051	92%
NYPP	NYISO_4_NYD	7592	1,206	681	664	1,392	22.34		PJM	PSEG_8_MSA_NewYork_G	8758	3,860	3,654	-1,146	-2,500	44.40	-446	22.1	8372	95%
NYPP NYPP	NYISO_3_NYC	8760 8298	6,711 4,946	2,657 2,500	1,909 1,639	3,259 2,336	41.23 38.71		PJM PJM	PSEG_8_MSA_NewYork_G PSEG_8_MSA_NewYork_G	8758 8758	3,860 3,860	3,654 3,654	-1,146 -1,146	-2,500 -2,500	44.40 44.40	-446 -446	3.2 5.7	8087 8110	92% 92%
	NYISO_1_NYA SOCO 15 MSA Birmingham G	8553	12,464	9,217	2,104	5,025	38.50		VACAR	SCEG 9 MSA Charleston G	8736	1,152	1,944	-1,146	-1,451	39.91	-204	1.4	2293	26%
	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60		VACAR	SCEG_9_MSA_Charleston_G	8736	1,152	1,944	-584	-1,451	39.91	-204	1.3	2502	28%
	SOCO 28 MSA Birmingham G	8760	2,535	1,090	1,319	1,836	38.44		VACAR	SCEG 9 MSA Charleston G	8736	1,152	1,944	-584	-1,451	39.91	-204	1.5	2313	26%
				1,030																
VACAR	SCPSA_10_MSA_Charleston_G	8760	1,680	0	1,413	1,680	39.64		VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	1.5	1827	21%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50	693	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	2.6	4390	50%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	6,802	0	5,102	6,381	39.15	1,750	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	2.0	1156	13%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,319	1,836	38.44	444	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	2.7	4387	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	11,765	1,583	4,305	9,149	39.09	1,474	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	2.1	4423	50%
VACAR	CPLE_1_MSA_Durham_G	7537	10,224	8,563	879	2,332	39.61	262	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	1.5	2299	26%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	3,574	2,674	612	1,568	38.60	194	VACAR	SCPSA_2_MSA_Charleston_L	8760	1,607	3,236	-1,637	-3,138	41.14	-590	2.5	4755	54%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	649	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	4.4	2388	27%
VACAR	DUK_9_MSA_Charlotte_G	8549	14,681	9,966	2,865	5,471	38.80	950	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	1.2	596	7%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	9.1	3200	36%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	2,535	1,090	1,319	1,836	38.44	444	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	1.6	526	6%
ENTERGY	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	351	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	2.0	1249	14%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	8122	3,431	4,125	-807	-3,054	40.02	-262	3.2	947	11%
	SOCO_15_MSA_Birmingham_G	8553	12,464	9,217	2,104	5,025	38.50		SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	1.5	511	6%
	SOCO 32 MSA Pascagoula G	8204	3,574	2,674	612	1,568	38.60		SOUTHERN	SOCO_10_MSA_Albany- Valdosta L	8122	3,431	4,125	-807	-3,054	40.02	-262	1.4	827	9%
	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75		SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	3,431	4,125	-807	-3,054	40.02	-262	4.3	530	6%
ENTERGY	EES 4 GEN Ouachita G	6307	6,345	2,417	1,467	3,701	37.99			SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,400	-2,611	39.17	-480	1.2	1039	12%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95			SOCO 16 MSA Atlanta L	8760	694	3,058	-1,400	-2,611	39.17	-480	8.2	3082	35%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77			SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,400	-2,611	39.17	-480	2.4	605	7%
	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64			SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,400	-2,611	39.17	-480	3.5	1564	18%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	1,012	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	694	3,058	-1,400	-2,611	39.17	-480	3.4	197	2%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	649	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	5,205	4,575	-737	-1,736	37.53	-219	1.9	3018	34%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	1,012	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	5,205	4,575	-737	-1,736	37.53	-219	1.8	2890	33%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	5,205	4,575	-737	-1,736	37.53	-219	6.6	3141	36%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub I	nformation								Sink Hub Info	rmation							1	Congestion I	ndicators	
					Average									Average				J		
		Source	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus			Sink	Gen	Load	net injection	Max net injection	Average Price	Revenue surplus	Price		ł l
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	U90 Hours	U90 %
Wallot / II ou		110010	·			()		, ,			110010		rroigin.	()				Dillororitia	000110010	000 70
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	1,012	SOUTHERN	SOCO_21_MSA_Atlanta_G	8631	3,334	2,733	-892	-1,981	38.85	-299	3.1	207	2%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2.119	2,480	35.64	649	SOUTHERN	SOCO_21_MSA_Atlanta_G	8631	3.334	2.733	-892	-1.981	38.85	-299	3.2	1961	22%
TVACTOR	TVY_1_IMOX_Olarkovillo_O		,		,		00.01	0.10	00011121111	0000_21_mo/t_/tmanta_0				002	1,001	00.00		0.2	1001	LL70
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	SOUTHERN	SOCO_21_MSA_Atlanta_G	8631	3,334	2,733	-892	-1,981	38.85	-299	2.1	595	7%
ENTERGY	EES_9_MSA_Russellville_G	3149	6.123	4,517	202	1,008	30.95	20	SOUTHERN	SOCO 21 MSA Atlanta G	8631	3,334	2,733	-892	-1,981	38.85	-299	7.9	3045	35%
												0,00								
ENTERGY	EES_9_MSA_Russellville_G TVA 1 MSA Chatt-Hunts G	3149 8756	6,123 17.334	4,517 9,966	202 3,234	1,008 7.588	30.95			SOCO_33_MSA_Atlanta_L SOCO 33 MSA Atlanta L	8760 8760	3	3,305	-1,952 -1,952	-3,314	39.20 39.20	-671 -671	8.3 3.5	3305 613	38% 7%
TVAUTHOR	TVA_T_MSA_CHall-Hurits_G	8/30	17,334	9,900	3,234	7,000	35.75	1,012	SOUTHERN	SOCO_33_MSA_Aliania_L	8760	3	3,305	-1,952	-3,314	39.20	-0/1	3.5	613	176
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	649	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	39.20	-671	3.6	1976	22%
ENTERCY	FFC 40 MCA Vielseburg C	8064	3.544	1,249	889	1,232	36.77	20.4	COLITHERN	COCO 22 MCA Atlanta I	8760	2	3,305	-1,952	-3,314	39.20	-671	2.4	1061	12%
ENTERGY	EES_10_MSA_Vicksburg_G	0004	3,344	1,249	009	1,232	30.77	204	SOUTHERN	SOCO_33_MSA_Atlanta_L	6700	3	3,303	-1,952	-3,314	39.20	-071	2.4	1001	1270
ENTERGY	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	351	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3	3,305	-1,952	-3,314	39.20	-671	1.2	1365	16%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	COLITHEDA	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,941	-3,087	39.37	-669	2.6	987	11%
ENTERGI	EES_TO_WISA_VICKSDUIG_G	0004	3,344	1,249	009	1,232	30.77	204	SOUTHERN	30CO_5_GEN_GEFORT_L	6700	2,090	3,403	-1,941	-3,007	39.31	-009	2.0	901	1176
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	649	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,941	-3,087	39.37	-669	3.7	1853	21%
TVALITHOR	TVA 1 MSA Chatt-Hunts G	8756	17.334	9,966	3.234	7,588	35.75	1 012	SOLITHEDN	SOCO 5 GEN GEPCHY L	8760	2,098	3,403	-1.941	-3,087	39.37	-669	3.6	593	7%
TVAOTTION	TVA_1_WISA_CHARFIGHTS_G	0730	17,554	3,300	3,234	7,500	33.73	1,012	SOUTHLIN	OCCO_3_GEN_GEN CHT_E	6700	2,030	3,403	-1,541	-5,007	33.37	-003	5.0	333	7 70
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2,098	3,403	-1,941	-3,087	39.37	-669	8.4	3233	37%
ENTERGY	EES 4 GEN Ouachita G	6307	6,345	2,417	1,467	3,701	37.99	351	SOUTHERN	SOCO 5 GEN GEPCHY L	8760	2,098	3,403	-1,941	-3,087	39.37	-669	1.4	1890	22%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	1,012		SOCO_6_MSA_Augusta-Richm	8760	0	1,187	-720	-1,220	39.16	-247	3.4	134	2%
										SOCO_6_MSA_Augusta-										
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	2,544	150	2,119	2,480	35.64	649	SOUTHERN	Richmond_L SOCO_6_MSA_Augusta-	8760	0	1,187	-720	-1,220	39.16	-247	3.5	1297	15%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	3,544	1,249	889	1,232	36.77	264	SOUTHERN	Richmond_L	8760	0	1,187	-720	-1,220	39.16	-247	2.4	529	6%
ENTEROY	EEO 4 OEN Ourskip O	6307	6,345	2,417	4 407	0.704	07.00	054	COLITUEDA	SOCO_6_MSA_Augusta-	8760	0	1 107	700	4 000	00.40	-247	1.2	1632	19%
ENTERGY	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	351	SOUTHERN	Richmond_L SOCO_6_MSA_Augusta-	8760	0	1,187	-720	-1,220	39.16	-247	1.2	1632	19%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95	20	SOUTHERN		8760	0	1,187	-720	-1,220	39.16	-247	8.2	2847	32%
ENTERGY	FFC 0 MCA Dueselluille C	3149	6,123	4,517	202	1,008	30.95	20	COLITHEDA	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	39.21	-391	8.3	2200	200/
ENTERGT	EES_9_MSA_Russellville_G	3149	0,123	4,517	202	1,006	30.95	20	SOUTHERN	SOCO_6_WSA_Alianta_L	8760	U	1,925	-1,139	-1,932	39.21	-391	0.3	3298	38%
ENTERGY	EES_4_GEN_Ouachita_G	6307	6,345	2,417	1,467	3,701	37.99	351	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	39.21	-391	1.2	1377	16%
TVAUTHOR	TVA 4 MSA Clarksville G	8592	2,544	150	2,119	2,480	35.64	640	SOLITHEDN	SOCO 8 MSA Atlanta L	8760	0	1,925	-1,139	-1,932	39.21	-391	3.6	1934	22%
TVAOTTION	TVA_4_WISA_Clarksville_G	0002	2,044	130	2,113	2,400	33.04	043	SOUTHLIN	OCCO_0_WOA_Allanta_L	6700	U	1,323	-1,100	-1,332	33.21	-331	5.0	1934	2270
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	17,334	9,966	3,234	7,588	35.75	1,012	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	0	1,925	-1,139	-1,932	39.21	-391	3.5	603	7%
ENTERGY	EES 10 MSA Vicksburg G	8064	3.544	1,249	889	1,232	36.77	264	SOLITHERN	SOCO 8 MSA Atlanta L	8760	0	1.925	-1.139	-1,932	39.21	-391	2.4	1062	12%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95			TVA_3_MSA_Knoxville_L	8760	3,684	5,102	-1,372	-2,941	33.65	-405	2.7	2967	34%
MISO	LGEE_3_GEN_Gehnt2_G	8760	2,000	225	1,554	1,900	33.05			TVA_5_MSA_Nashville_L	8689	9,154	8,858	-1,676	-5,752	35.84	-522	2.8	5473	62%
MISO ENTERGY	BREC_3_County_Webster_G AECI_4_GEN_NewMadrid1_G	8760 8760	1,355 2,315	476 248	855 1,108	1,129 1,604	32.98 32.71			TVA_5_MSA_Nashville_L TVA 5 MSA Nashville L	8689 8689	9,154 9,154	8,858 8,858	-1,676 -1,676	-5,752 -5,752	35.84 35.84	-522 -522	2.9 3.1	6069 2455	69% 28%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,004	30.95			TVA_5_MSA_Nashville_L	8689	9,154	8,858	-1,676	-5,752	35.84	-522	4.9	2889	33%
ENTERGY	EES_9_MSA_Russellville_G	3149	6,123	4,517	202	1,008	30.95			TVA_7_MSA_Memphis_L	8714	7,215	5,982	-1,577	-4,469	35.75	-491	4.8	1044	12%
MISO PJM	LGEE_3_GEN_Gehnt2_G PJM500 3 MSA Pittsburgh G	8760 8760	2,000 1,705	225	1,554 1,438	1,900 1,700	33.05 39.08		TVAUTHOR PJM	TVA_7_MSA_Memphis_L VAP 15 MSA VB-Norfolk L	8714 8760	7,215 435	5,982 1,297	-1,577 -499	-4,469 -1,124	35.75 42.94	-491 -188	2.7 3.9	4945 7585	56% 86%
PJM	VAP 7 G	7408	4,179	303	1,507	3,608	41.18		PJM	VAP 15 MSA VB-Norfolk L	8760	435	1,297	-499	-1,124	42.94	-188	1.8	5870	67%
VACAR	CPLE_1_MSA_Durham_G	7537	10,224	8,563	879	2,332	39.61		PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-499	-1,124	42.94	-188	3.3	6460	74%
PJM PJM	PJM500_9_MSA_Pittsburgh_G AEP 8 GEN Amos01 G	8664 8760	1,700 19,694	6,544	1,492 6,383	1,700 10,230	39.35 36.20	509 2,024	PJM P IM	VAP_15_MSA_VB-Norfolk_L VAP 15 MSA VB-Norfolk L	8760 8760	435 435	1,297 1,297	-499 -499	-1,124 -1,124	42.94 42.94	-188 -188	3.6 6.7	7557 7842	86% 89%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81		PJM	VAP_15_MSA_VB-Norfolk_L	8760	435	1,297	-499	-1,124	42.94	-188	4.1	7391	84%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08	492	PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	44.35	-250	5.3	7569	86%
PJM PJM	VAP_7_G VAP 1 MSA Richmond G	7408 8760	4,179 10,524	303 3,579	1,507 3,424	3,608 6,047	41.18 43.27	460 1,298	PJM P IM	VAP_27_MSA_DC_L VAP_27_MSA_DC_L	8760 8760	0	1,048 1,048	-643 -643	-1,075 -1,075	44.35 44.35	-250 -250	3.2 1.1	5847 3375	67% 38%
PJM	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024		VAP_27_MSA_DC_L VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	44.35	-250	8.1	7841	89%
PJM	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81		PJM	VAP_27_MSA_DC_L	8760	0	1,048	-643	-1,075	44.35	-250	5.5	7564	86%
PJM VACAR	PJM500_9_MSA_Pittsburgh_G CPLE 1 MSA Durham G	8664 7537	1,700 10,224	8,563	1,492 879	1,700 2,332	39.35 39.61		PJM PJM	VAP_27_MSA_DC_L VAP 27 MSA DC L	8760 8760	0	1,048 1.048	-643 -643	-1,075 -1,075	44.35 44.35	-250 -250	5.0 4.7	7472 7349	85% 84%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0,503	1,438	1,700	39.08		PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,858	-2,931	44.34	-722	5.3	7646	87%

Task 2: Appendix 4, Corridors Results by Scenario LowCase2011R2

Source Hub In	formation								Sink Hub Info	rmation								Congestion I	ndicators	
					Average									Average				g		
					net	Max net	Average	Revenue						net	Max net	Average	Revenue			
		Source	Gen	Load	injection	injection	Price	surplus			Sink	Gen	Load	injection	injection	Price	surplus	Price		
Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)		Market Area	Hub Name	Hours	Weight	Weight	(MW)	(MW)	(\$/MWh)	(\$MM)	Differential	190 Hours	U90 %
	VAP 1 MSA Richmond G	8760	10,524	3,579	3,424	6,047	43.27	1,298		VAP_33_MSA_DC_L	8760	910	2,983	-1,858	-2,931	44.34	-722	1.1	4125	47%
	PJM500 9 MSA Pittsburgh G	8664	1,700	0,075	1,492	1,700	39.35		PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,858	-2,931	44.34	-722	5.0	7643	87%
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024		VAP 33 MSA DC L	8760	910	2,983	-1,858	-2,931	44.34	-722	8.1	8041	92%
	CPLE 1 MSA Durham G	7537	10,224	8,563	879	2,332	39.61		PJM	VAP 33 MSA DC L	8760	910	2,983	-1,858	-2,931	44.34	-722	4.7	7567	86%
		8760				3,904	38.81				8760						-722			
	AP_1_County_Harrison_G		6,563	2,223	2,615				PJM	VAP_33_MSA_DC_L		910	2,983	-1,858	-2,931	44.34		5.5	7609	87%
	VAP_7_G	7408	4,179	303	1,507	3,608	41.18		PJM	VAP_33_MSA_DC_L	8760	910	2,983	-1,858	-2,931	44.34	-722	3.2	5853	67%
	PJM500_3_MSA_Pittsburgh_G	8760	1,705	0	1,438	1,700	39.08			VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	15.4	7063	80%
	PJM500_4_MSA_Philadelphia_G	8702	2,383	0	1,806	3,346	44.57		PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	9.9	5628	64%
	CPLE_1_MSA_Durham_G	7537	10,224	8,563	879	2,332	39.61			VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	14.9	5361	61%
	AP_1_County_Harrison_G	8760	6,563	2,223	2,615	3,904	38.81		PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	15.7	5584	64%
	AEP_8_GEN_Amos01_G	8760	19,694	6,544	6,383	10,230	36.20	2,024		VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	18.3	6164	70%
	PJM500_9_MSA_Pittsburgh_G	8664	1,700	0	1,492	1,700	39.35		PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	15.1	7062	80%
PJM	PJM500_7_MSA_York-Hanover_	8760	2,696	0	2,072	2,570	44.70	811	PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	9.8	5770	66%
PJM	PJM500_5_MSA_DC_G	8760	1,730	0	1,600	1,730	45.52	638	PJM	VAP_7_G	1352	4,179	303	-990	-2,512	54.49	-73	9.0	4867	55%
PJM	VAP 1 MSA Richmond G	8760	10,524	3,579	3,424	6,047	43.27	1,298	PJM	VAP 7 G	1352	4,179	303	-990	-2,512	54.49	-73	11.2	5715	65%
	_																			
MAPP	NPPD 4 GEN Gentleman G	8235	2,702	148	790	1,472	13.70	89	SPP	WERE 4 GEN Wolfcreek G	4445	3,510	2,459	-449	-1,676	39.14	-78	25.4	8757	100%
												-,,,,,,	, , , ,		,	1			2.31	
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	2.315	248	1.108	1.604	32.71	317	SPP	WERE 4 GEN Wolfcreek G	4445	3.510	2,459	-449	-1,676	39.14	-78	6.4	7749	88%
LIVI LIVO	71201_1_0211_110111111111111111_0	0.00	2,010	2.0	1,100	1,001	02.7	0	0	**************************************		0,010	2,100		1,010	00.11		0		0070
SPP	AEPW 5 MSA Tulsa G	7180	4,226	2,571	394	1,371	30.78	87	SPP	WERE_4_GEN_Wolfcreek_G	4445	3,510	2,459	-449	-1,676	39.14	-78	8.4	3204	36%
011	ALI W_5_WOA_Tuisa_G	7 100	7,220	2,011	004	1,071	30.70	07	011	WEIKE_4_GEIK_Wolldreck_G	7770	0,010	2,400	113	1,070	00.14	70	0.4	3204	30 /6
SPP	WERE 1 MSA Manhattan G	8145	2,988	409	1,217	2,299	29.25	200	SPP	WERE 4 GEN Wolfcreek G	4445	3,510	2,459	-449	-1,676	39.14	-78	9.9	807	9%
SFF	WERE_I_WOA_Walifiattali_G	0140	2,900	409	1,217	2,299	29.23	290	SFF	WERE_4_GEIN_Wollcreek_G	4440	3,310	2,409	-449	-1,070	39.14	-10	9.9	807	970
000	KAOD 4 MOA KO' O	7000	070		4 405	4.500	45.55	440	ODD	WEDE 4 OEN Walter I. O	4445	0.540	0.450	440	4.070	00.44	70	00.0	7000	0.407
	KACP_4_MSA_KansasCity_G	7896	670	- 0	1,185	1,520	15.55		SPP	WERE_4_GEN_Wolfcreek_G	4445	3,510	2,459	-449	-1,676	39.14	-78	23.6	7380	84%
	OTP_9_GEN_BigStone_G	8640	1,189	136	880	1,176	11.27			XEL_3_MSA_Minneapolis_G	5811	7,596	7,622	-900	-2,499	33.04	-173	21.8	8645	98%
MISO	ALTE_2_MSA_Madison_G	8746	1,665	441	491	1,061	27.05	116	MISO	XEL_3_MSA_Minneapolis_G	5811	7,596	7,622	-900	-2,499	33.04	-173	6.0	2393	27%
																				-
		l														t				
																<del>                                     </del>				
																<del>                                     </del>				
																<del>                                     </del>				
																<b></b>		<b></b>		
		<b></b>														<b></b>				
																<b></b>				
																ļ.				
																ļ				
																ļ				
																h				
																<del>                                     </del>				

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name		Market Area		Hours	Differential	Hours	U90 %
	MEC_3_MSA_DesMoines_G			AMRN_12_MSA_StLouis_L	2085	26.9	3893	44%
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_7_CT	1143	26.4	6958	79%
	IESO_15_G	8382	NYPP	NYISO_11_NYK	8784	25.4	6963	79%
ONTARIO	IESO_6_G	8784		NYISO_11_NYK	8784	25.4	6963	79%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_11_NYK	8784	25.4	6963	79%
ONTARIO	IESO_15_G	8382	NYPP	NYISO_10_NYJ	8784	23.9	8784	100%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_10_NYJ	8784	23.8	8784	100%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_10_NYJ	8784	23.8	8784	100%
PJM	NI_15_MSA_Davenport_G	8664	MISO	AMRN_12_MSA_StLouis_L	2085	23.5	5202	59%
				OKGE_4_MSA_OklahomaCity				
SPP	WERE_1_MSA_Manhattan_G	8771	SPP	_L	8783	23.3	8329	95%
MISO	OTP_9_GEN_BigStone_G	8784	MISO	XEL_3_MSA_Minneapolis_G	4672	23.0	7840	89%
ONTARIO	IESO_15_G	8382	NYPP	NYISO_9_NYI	8467	22.5	6955	79%
ONTARIO	IESO_6_G	8784		NYISO_9_NYI	8467	22.5	6956	79%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_9_NYI	8467	22.5	6956	79%
NYPP	NYISO_1_NYA	8254	NYPP	NYISO_11_NYK	8784	22.2	6963	79%
	NI_7_MSA_Rochelle_G		MISO	AMRN_12_MSA_StLouis_L	2085		5759	66%
	NYISO_1_NYA	8254	NYPP	NYISO_10_NYJ	8784	20.7	8784	100%
	NYISO_1_NYA			NYISO_9_NYI	8467	19.4	6868	78%
ONTARIO	IESO_15_G	8382	NYPP	NYISO_7_NYG	7979	18.5	6952	79%
SPP	WERE_1_MSA_Manhattan_G	8771	SPP	WERE_4_GEN_Wolfcreek_G	3653	18.5	3355	38%
ONTARIO	IESO_6_G	8784		NYISO_7_NYG	7979	18.4	6952	79%
ONTARIO	IESO_7_G	8784		NYISO_7_NYG	7979	18.4	6953	79%
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_9_MSA_Russellville_G	2533	SPP	_L ,	8783	18.0	3996	45%
PJM	AEP_8_GEN_Amos01_G	8783	PJM	VAP_7_G	1848	17.8	6655	76%
PJM	PENELEC_2_MSA_DuBois_G	8336	NYPP	NYISO_11_NYK	8784	17.3	6963	79%
PJM	NI_2_MSA_Chicago_G	8784	MISO	AMRN_12_MSA_StLouis_L	2085	17.3	3670	42%
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_9_NWKST	8784	17.3	6972	79%
	NI_6_MSA_Chicago_G	8111	MISO	AMRN_12_MSA_StLouis_L	2085	17.2	3677	42%
	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_8_MSA_DC-VA-MD_L	8784	16.7	8036	91%
	NI_20_MSA_Chicago_G	7214	MISO	AMRN_12_MSA_StLouis_L	2085	16.7	3664	42%
	NPPD_4_GEN_Gentleman_G	8760	MAPP	OPPD_5_MSA_Omaha_L	8784	16.7	8367	95%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	16.7	8019	91%
MISO	IP_8_GEN_Clinton_G	8016	MISO	AMRN_12_MSA_StLouis_L	2085		1758	20%
MISO	FE_9_MSA_Weirton_G	8571	PJM	AP_8_MSA_DC-VA-MD_L	8784	16.6	7993	91%
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_6_WCMA	8643	16.2	6958	79%
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_4_NEBOS	8691	16.1	6958	79%
				AP_7_MSA_Hagerstown-				
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	Martinsburg_L	8784	16.0	8003	91%
	-			AP_7_MSA_Hagerstown-				
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	16.0	7988	91%
				AP_7_MSA_Hagerstown-				
MISO	FE_9_MSA_Weirton_G	8571	PJM	Martinsburg_L	8784	15.9	7957	91%
PJM	PENELEC_2_MSA_DuBois_G	8336	NYPP	NYISO_10_NYJ	8784	15.8	6961	79%
PJM	AEP_8_GEN_Amos01_G	8783	PJM	AP_8_MSA_DC-VA-MD_L	8784	15.3	8060	92%
NYPP	NYISO_1_NYA	8254	NYPP	NYISO_7_NYG	7979	15.3	6792	77%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_7_CT	1143	15.2	8772	100%
PJM	AEP_8_GEN_Amos01_G	8783	PJM	VAP_33_MSA_DC_L	8784	15.1	8132	93%
NYPP	NYISO_1_NYA	8254	NEPOOL	NEPOOL_10_RI	6570	15.1	6958	79%
NYPP	NYISO_1_NYA	8254	PJM	PSEG_8_MSA_NewYork_G	8784	15.0	7874	90%
MISO	BREC_3_County_Webster_G	8784	MISO	LGEE_5_MSA_Lexington_L	8784	14.9	7398	84%
PJM	AEP_8_GEN_Amos01_G	8783	PJM	VAP_27_MSA_DC_L	8784	14.9	8033	91%
MISO	IP_7_GEN_Baldwin_G	8784	MISO	AMRN_12_MSA_StLouis_L	2085	14.9	1093	12%
NYPP	NYISO_1_NYA	8254	PJM	PSEG_3_MSA_NewYork_L	8784	14.9	7901	90%
				AP_7_MSA_Hagerstown-				
PJM	AEP_8_GEN_Amos01_G	8783	PJM	Martinsburg_L	8784	14.6	8032	91%
PJM	PENELEC_2_MSA_DuBois_G	8336	NYPP	NYISO_9_NYI	8467	14.5	6925	79%
		22-1	5		0=0.4			
NYPP	NYISO_1_NYA	8254		PSEG_5_MSA_Philadelphia_L	8784		7916	90%
PJM	NI_15_MSA_Davenport_G	8664		AEP_2_STA_TN-WV_L	8784		6137	70%
MISO	XEL_3_MSA_Minneapolis_G			GRE_4_MSA_Minneapolis_L	8784		0	0%
	BREC_3_County_Webster_G			TVA_5_MSA_Nashville_L	8541		7759	88%
PJM	NI_15_MSA_Davenport_G	8664		AEP_1_MSA_Lynchburg_G	8784		6898	79%
MISO	CIN_8_MSA_Evansville_G	8784	MISO	AMRN_12_MSA_StLouis_L	2085	13.5	2429	28%
SPP	AEPW 9 MSA MountPleasant	7676	SPP	OKGE_4_MSA_OklahomaCity	8783	13.3	4668	53%
01 1	ALI W_3_WOA_WOUTH TEASAITL	1010	01 1		0703	13.3	4000	JJ /0

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_2_MSA_Batesville_G	8784	SPP	_L	8783	13.2	5940	68%
ENTERGY	EES_9_MSA_Russellville_G	2533	ENTERGY	EES_5_MSA_NewOrleans_G	8784	13.1	6875	78%
MISO	AMRN_12_MSA_StLouis_L	6699	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	12.9	5412	62%
PJM	NI_15_MSA_Davenport_G	8664	PJM	NI_6_MSA_Chicago_G	673	12.8	4800	55%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	AMRN_12_MSA_StLouis_L	2085	12.7	6024	69%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_5_MSA_Tulsa_G	7426		_L	8783	12.7	1435	16%
	NEPOOL_3_ME	3923	NEPOOL	NEPOOL_7_CT	1143	12.4	7452	85%
NYPP	NYISO_6_NYF	7469		NEPOOL_7_CT	1143	12.3	8753	100%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN		7519	12.3	3642	41%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	MISO	AMRN_12_MSA_StLouis_L	2085	12.2	2888	33%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	673	12.2	4476	51%
	WEC_1_MSA_Chicago_G			METC_9_MSA_Kalamazoo_L	8784		5709	65%
	NEPOOL_2_NH			NEPOOL_7_CT	1143		7477	85%
	AEP_8_GEN_Amos01_G	8783		VAP_15_MSA_VB-Norfolk_L	8784	12.0	8024	91%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_7_G	1848	12.0	5642	64%
				AEP_9_MSA_Canton-				
	NI_15_MSA_Davenport_G	8664		Massillon_L	8784		5384	61%
PJM	NI_7_MSA_Rochelle_G	8784		AEP_2_STA_TN-WV_L	8784	11.7	6067	69%
	NI_7_MSA_Rochelle_G	8784		AEP_1_MSA_Lynchburg_G	8784		6603	75%
	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_7_G	1848	11.6	6872	78%
PJM	AEP_8_GEN_Amos01_G		MISO	AMRN_12_MSA_StLouis_L	2085	11.3	817	9%
MISO	WEC_1_MSA_Chicago_G		MISO	METC_8_MSA_BayCity_G	8326		5867	67%
	MEC_3_MSA_DesMoines_G	7991	MISO	AMRN_2_County_Macon_L	8784	11.2	5724	65%
	NYISO_3_NYC	8784	NYPP	NYISO_11_NYK	8784	11.1	8784	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G		FRCC	FPL_7_MSA_Miami_L	8784	11.0	5655	64%
	SOCO_15_MSA_Birmingham_G		FRCC	FPL_3_MSA_Miami_L	8784	10.9	5258	60%
PJM	PJM500_9_MSA_Pittsburgh_G	8784		VAP_7_G	1848	10.9	7094	81%
SOUTHERN	SOCO_28_MSA_Birmingham_G		FRCC	FPL_7_MSA_Miami_L	8784	10.9	5651	64%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_3_MSA_Miami_L	8784	10.9	5257	60%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_6_MSA_Chicago_G	673	10.8	4438	51%
	SOCO_26_MSA_Macon_G			FPL_7_MSA_Miami_L	8784		5349	61%
	SOCO_26_MSA_Macon_G			FPL_3_MSA_Miami_L	8784	10.8	5361	61%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8775	FRCC	FPL_7_MSA_Miami_L	8784	10.7	5644	64%
SOUTHERN	SOCO_32_MSA_Pascagoula_G			FPL_7_MSA_Miami_L	8784	10.7	5894	67%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8775	FRCC	FPL_3_MSA_Miami_L	8784	10.6	5253	60%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784		WERE_4_GEN_Wolfcreek_G	3653		7437	85%
	SOCO_32_MSA_Pascagoula_G			FPL_3_MSA_Miami_L	8784		5533	63%
	PENELEC_2_MSA_DuBois_G			NYISO_7_NYG	7979		6924	79%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_6_MSA_Chicago_G	673	10.4	5812	66%
				SOCO_10_MSA_Albany-				
	TVA_4_MSA_Clarksville_G		SOUTHERN	_	7519		5564	63%
	NEPOOL_5_SEMA			NEPOOL_7_CT	1143		2246	26%
VACAR	CPLE_1_MSA_Durham_G	7843		VAP_7_G	1848	10.1	5436	62%
				AEP_9_MSA_Canton-				
	NI_7_MSA_Rochelle_G	8784		Massillon_L	8784		5576	63%
	AP_1_County_Harrison_G	8784		PEPCO_1_MSA_DC_L	8784		7772	88%
MISO	AMRN_12_MSA_StLouis_L	6699		AEP_2_STA_TN-WV_L	8784	9.9	6680	76%
				BGE_9_MSA_Baltimore-				
	PJM500_3_MSA_Pittsburgh_G	8784		Towson_L	8784		8004	91%
	AMRN_12_MSA_StLouis_L	6699		AEP_1_MSA_Lynchburg_G	8784		6903	79%
	PJM500_3_MSA_Pittsburgh_G	8784		PEPCO_1_MSA_DC_L	8784		7861	89%
	NYISO_3_NYC			NYISO_10_NYJ	8784		8784	100%
PJM	AP_1_County_Harrison_G	8784		AP_8_MSA_DC-VA-MD_L	8784	9.5	7638	87%
				BGE_10_MSA_Baltimore-				
	PJM500_3_MSA_Pittsburgh_G	8784		Towson_L	8784		7970	91%
MISO	LGEE_3_GEN_Gehnt2_G			LGEE_5_MSA_Lexington_L	8784		4258	48%
MISO	NIPS_8_MSA_Chicago_G	8765		AEP_2_STA_TN-WV_L	8784	9.3	1455	17%
				BGE_5_MSA_Baltimore-				
	PJM500_3_MSA_Pittsburgh_G	8784		Towson_L	8784		7958	91%
	AP_1_County_Harrison_G	8784		VAP_33_MSA_DC_L	8784		7752	88%
MISO	NIPS_8_MSA_Chicago_G	8765	PJM	AEP_1_MSA_Lynchburg_G	8784	9.2	4786	54%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
				BGE_9_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	9.2	7942	90%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	9.1	7904	90%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_27_MSA_DC_L	8784	9.1	7607	87%
MISO	AMRN_12_MSA_StLouis_L	6699		NI_6_MSA_Chicago_G	673	9.0	5534	63%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	8.9	8698	99%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	8.9	3558	41%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	8.9	3589	41%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	8.9	3589	41%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	8.9	3522	40%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	8.9	7842	89%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_33_MSA_DC_L	8784	8.9	8003	91%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	SOCO_21_MSA_Atlanta_G	8765	8.9	3499	40%
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN		8784	8.8	2986	34%
PJM	AP_1_County_Harrison_G	8784		AP_7_MSA_Hagerstown- Martinsburg_L	8784	8.8	7615	87%
	PJM500_9_MSA_Pittsburgh_G	8784		BGE_10_MSA_Baltimore- Towson_L	8784		7898	90%
	SOCO_15_MSA_Birmingham_G		FRCC	FPL_2_MSA_FortMyers_G	8506		4980	57%
	PJM500_3_MSA_Pittsburgh_G	8784		VAP_27_MSA_DC_L	8784		7774	89%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_2_MSA_FortMyers_G	8506	8.7	4976	57%
<u> _                                    </u>			<b>.</b>	BGE_5_MSA_Baltimore-				
	PJM500_9_MSA_Pittsburgh_G	8784		Towson_L	8784		7887	90%
	SOCO_26_MSA_Macon_G		FRCC	FPL_2_MSA_FortMyers_G	8506		5113	58%
	NYISO_8_NYH			NEPOOL_7_CT	1143		8751	100%
	NIPS_8_MSA_Chicago_G	8765		NI_6_MSA_Chicago_G	673		17	0%
	SOCO_31_MSA_Atlanta_G		FRCC	FPL_2_MSA_FortMyers_G	8506		4975	57%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	8.5	7965	91%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	FRCC	FPL_2_MSA_FortMyers_G	8506	8.4	5282	60%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	8.4	7890	90%
MISO	ALTE_2_MSA_Madison_G	8616	MISO	XEL_3_MSA_Minneapolis_G	4672	8.4	2320	26%
SPP	AEPW_9_MSA_MountPleasant_	7676	ENTERGY	EES_5_MSA_NewOrleans_G	8784	8.3	8744	100%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	8.3	8453	96%
NEPOOL	NEPOOL_3_ME	3923		NYISO_11_NYK	8784	8.3	8784	100%
				AEP_9_MSA_Canton-				
	AMRN_12_MSA_StLouis_L	6699		Massillon_L	8784		6085	69%
NYPP	NYISO_3_NYC			NYISO_9_NYI	8467	8.2	8687	99%
PJM	PJM500_9_MSA_Pittsburgh_G	8784		VAP_33_MSA_DC_L	8784		8090	92%
NYPP	NYISO_6_NYF			NYISO_11_NYK	8784	8.1	8784	100%
PJM	PJM500_9_MSA_Pittsburgh_G	8784		VAP_27_MSA_DC_L	8784		7782	89%
	PENELEC_2_MSA_DuBois_G	8336		PL_7_MSA_Allentown_L	8784		7495	85%
	LGEE_3_GEN_Gehnt2_G			TVA_5_MSA_Nashville_L	8541		6261	71%
	SOCO_15_MSA_Birmingham_G			FPC_4_MSA_Tampa_L	8784		4752	54%
NEPOOL	NEPOOL_2_NH	8426	NYPP	NYISO_11_NYK	8784	7.9	8784	100%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPC_4_MSA_Tampa_L	8784	7.9	4753	54%
	AEPW_5_MSA_Tulsa_G	7426	SPP	WERE_4_GEN_Wolfcreek_G	3653		4472	51%
	EES_9_MSA_Russellville_G			TVA_5_MSA_Nashville_L	8541		6094	69%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPC_4_MSA_Tampa_L	8784	7.8	4895	56%
	EES_9_MSA_Russellville_G			SOCO_17_MSA_Mobile_G	6709		3475	40%
PJM	NI_15_MSA_Davenport_G	8664		AMRN_2_County_Macon_L	8784	7.8	5804	66%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	7.8	7949	90%
PJM	PJM500_7_MSA_York-Hanover_	8784	PJM	PECO_5_MSA_Philadelphia_L	6653	7.7	3177	36%
SPP	AEPW_5_MSA_Tulsa_G	7426		EES_5_MSA_NewOrleans_G	8784	7.7	7726	88%
				AEP_9_MSA_Canton-				
MISO	NIPS_8_MSA_Chicago_G	8765	PJM	Massillon_L	8784	7.7	1501	17%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area		Hours	Market Area		Hours	Differential	Hours	U90 %
	NYISO_1_NYA			NEPOOL_3_ME	4861	7.7	7038	80%
SOUTHERN	SOCO_31_MSA_Atlanta_G			FPC_4_MSA_Tampa_L	8784	7.7	4754	54%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	FRCC	FPC_4_MSA_Tampa_L	8784	7.6	5102	58%
VACAR	CPLE_1_MSA_Durham_G	7843	PJM	VAP_33_MSA_DC_L	8784	7.4	7574	86%
PJM	NI_2_MSA_Chicago_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	7.4	2494	28%
				EES_7_MSA_Beaumont-				
ENTERGY	EES_9_MSA_Russellville_G	2533	ENTERGY	PortArthur_G	6739	7.3	6610	75%
PJM	NI_2_MSA_Chicago_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	7.3	5502	63%
VACAR	CPLE_1_MSA_Durham_G	7843	PJM	VAP_27_MSA_DC_L	8784	7.3	7253	83%
PJM	NI_6_MSA_Chicago_G	8111	PJM	AEP_2_STA_TN-WV_L	8784	7.3	2497	28%
PJM	PJM500_4_MSA_Philadelphia_G	8374	PJM	PECO_5_MSA_Philadelphia_L	6653	7.3	0	0%
PJM	NI_6_MSA_Chicago_G	8111	PJM	AEP_1_MSA_Lynchburg_G	8784	7.2	5513	63%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	LGEE_5_MSA_Lexington_L	8784	7.1	5276	60%
ENTERGY	EES_9_MSA_Russellville_G	2533	ENTERGY	EES_1_MSA_Jackson_L	8784	7.1	2779	32%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	6.9	5481	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	6.9	5494	63%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	6.9	5486	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	6.9	5425	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616		SOCO_21_MSA_Atlanta_G	8765	6.8	5467	62%
				SOCO_6_MSA_Augusta-				
	TVA_4_MSA_Clarksville_G		SOUTHERN		8784		5433	62%
	NI_20_MSA_Chicago_G		PJM	AEP_2_STA_TN-WV_L	8784	6.8	4506	51%
	NEPOOL_3_ME			NYISO_10_NYJ	8784	6.7	8784	100%
	NEPOOL_7_CT			NYISO_11_NYK	8784	6.7	8784	100%
	NI_20_MSA_Chicago_G	7214		AEP_1_MSA_Lynchburg_G	8784	6.7	5421	62%
	AMRN_12_MSA_StLouis_L		MISO	CIN_1_MSA_Indianapolis_L	8784	6.6	6063	69%
	SOCO_15_MSA_Birmingham_G			FPC_3_MSA_Orlando_L	8784	6.6	4237	48%
NYPP	NYISO_6_NYF	7469	NYPP	NYISO_10_NYJ	8784	6.6	8784	100%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	BGE_7_MSA_Baltimore-Towson	7994	PJM	PECO_5_MSA_Philadelphia_L	6653	6.6	4408	50%
PJM	NI_2_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	673	6.5	0	0%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPC_3_MSA_Orlando_L	8784	6.5	4237	48%
PJM	NI_15_MSA_Davenport_G	8664	PJM	NI_13_MSA_Chicago_L	8784	6.5	4821	55%
	NI_15_MSA_Davenport_G	8664	PJM	NI_3_MSA_Chicago_L	8784	6.5	4816	55%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPC_3_MSA_Orlando_L	8784	6.4	4390	50%
NEPOOL	NEPOOL_2_NH	8426		NYISO_10_NYJ	8784	6.4	8784	100%
SOUTHERN	SOCO_31_MSA_Atlanta_G			FPC_3_MSA_Orlando_L	8784	6.3	4234	48%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	FRCC	FPC_3_MSA_Orlando_L	8784	6.3	4736	54%
MISO	LGEE_3_GEN_Gehnt2_G	8784	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	6.2	5104	58%
	LGEE_3_GEN_Gehnt2_G	8784	TVAUTHOR	TVA_7_MSA_Memphis_L	8773	6.2	5249	60%
	BREC_3_County_Webster_G			LGEE_9_MSA_Louisville_G	8784	6.2	7329	83%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_15_MSA_VB-Norfolk_L	8784	6.2	7695	88%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_9_NWKST	8784	6.1	8774	100%
MISO	NIPS_8_MSA_Chicago_G	8765	MISO	CIN_1_MSA_Indianapolis_L	8784	6.1	1355	15%
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_11_NYK	8784	6.1	8784	100%
ENTERGY	EES_9_MSA_Russellville_G	2533	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	6.1	3521	40%
ENTERGY	EES_9_MSA_Russellville_G	2533	TVAUTHOR	TVA_7_MSA_Memphis_L	8773	6.1	1009	11%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_13_MSA_Chicago_L	8784	6.0	4476	51%
PJM	NI_20_MSA_Chicago_G	7214	PJM	NI_6_MSA_Chicago_G	673	5.9	0	0%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_3_MSA_Chicago_L	8784	5.9	4476	51%
				SOCO_32_MSA_Pascagoula_				
ENTERGY	EES_9_MSA_Russellville_G	2533	SOUTHERN	G	1253		3262	37%
PJM	NI_7_MSA_Rochelle_G	8784	MISO	AMRN_2_County_Macon_L	8784	5.9	5721	65%
MISO	EKPC_8_MSA_Maysville_G	8784	MISO	LGEE_5_MSA_Lexington_L	8784	5.9	1237	14%
ENTERGY	EES_8_MSA_BatonRouge_G	8520	ENTERGY	EES_5_MSA_NewOrleans_G	8784	5.8	5099	58%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_15_MSA_VB-Norfolk_L	8784	5.8	7850	89%
MISO	CIN_3_MSA_TerreHaute_G	7034	MISO	LGEE_5_MSA_Lexington_L	8784	5.8	129	1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	5.8	5984	68%
MISO	IP_8_GEN_Clinton_G	8016	PJM	NI_6_MSA_Chicago_G	673	5.8	161	2%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_17_MSA_Mobile_G	6709	5.8	5844	67%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	LAGN_1_MSA_BatonRouge_G	8784	ENTERGY	EES_5_MSA_NewOrleans_G	8784	5.7	6322	72%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8784	PJM	Massillon_L	8784	5.7	2535	29%
PJM	AEP_8_GEN_Amos01_G	8783	MISO	LGEE_5_MSA_Lexington_L	8784	5.7	18	0%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	ENTERGY	EES_9_MSA_Russellville_G	6251	5.6	5867	67%
				AEP_9_MSA_Canton-				
PJM	NI_6_MSA_Chicago_G	8111	PJM	Massillon_L	8784	5.6	2541	29%
				SOCO_10_MSA_Albany-				
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN		7519	5.6	282	3%
SPP	WERE_1_MSA_Manhattan_G	8771		AEPW_1_MSA_Tulsa_G	7434	5.5	8634	98%
				AEPW_9_MSA_MountPleasan				
ENTERGY	EES_9_MSA_Russellville_G	2533	SPP	t_G	1108	5.5	3749	43%
NEPOOL	NEPOOL_3_ME	3923	NYPP	NYISO_9_NYI	8467	5.4	8737	99%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	5.3	4893	56%
NYPP	NYISO_6_NYF	7469	NYPP	NYISO_9_NYI	8467	5.3	8626	98%
PJM	AEP_8_GEN_Amos01_G	8783	VACAR	DUK_4_MSA_Greenville_L	6816	5.2	5209	59%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	ENTERGY	EES_5_MSA_NewOrleans_G	8784		6331	72%
PJM	PJM500_9_MSA_Pittsburgh_G	8784		VAP_15_MSA_VB-Norfolk_L	8784	5.2	7922	90%
PJM	AEP_8_GEN_Amos01_G			DUK_8_MSA_Charlotte_L	8784		3560	41%
NEPOOL	NEPOOL_7_CT			NYISO_10_NYJ	8784		8777	100%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	ENTERGY	EES_9_MSA_Russellville_G	6251	5.1	4674	53%
				AEP_9_MSA_Canton-				
	NI_20_MSA_Chicago_G	7214		Massillon_L	8784		2532	29%
PJM	VAP_1_MSA_Richmond_G	8784		VAP_7_G	1848		5456	62%
	SEC_6_MSA_Palatka_G	8160		FPL_7_MSA_Miami_L	8784	5.1	4748	54%
	NEPOOL_2_NH			NYISO_9_NYI	8467		8771	100%
FRCC	SEC_6_MSA_Palatka_G	8160	FRCC	FPL_3_MSA_Miami_L	8784	5.0	4762	54%
	NYISO_3_NYC			NEPOOL_6_WCMA	8643		8396	96%
	NYISO_3_NYC	8784	NEPOOL	NEPOOL_4_NEBOS	8691	5.0	8770	100%
MISO	LGEE_3_GEN_Gehnt2_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	5.0	4295	49%
PJM	DLCO_7_MSA_Pittsburgh_G		MISO	FE_5_MSA_Cleveland_L	6473		4458	51%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_5_MSA_Cleveland_L	6473	4.7	4391	50%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area		Hours	Market Area		Hours	Differential	Hours	U90 %
	VAP_7_G	6936	PJM	AP_8_MSA_DC-VA-MD_L	8784	4.6	5365	61%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_13_MSA_Chicago_L	8784	4.6	4373	50%
MISO	FE_9_MSA_Weirton_G		MISO	FE_5_MSA_Cleveland_L	6473	4.6	3653	42%
	NI_7_MSA_Rochelle_G	8784		NI_3_MSA_Chicago_L	8784	4.6	4410	50%
	NEPOOL_5_SEMA	8784	NYPP	NYISO_10_NYJ	8784	4.5	8778	100%
	EKPC_8_MSA_Maysville_G			TVA_5_MSA_Nashville_L	8541	4.5	5678	65%
PJM	NI_15_MSA_Davenport_G	8664	MISO	WEC_3_MSA_Milwaukee_G	6898	4.5	4142	47%
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_11_NYK	8784	4.5	8784	100%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	Valdosta_L	7519	4.4	1389	16%
	SOCO_15_MSA_Birmingham_G			EES_5_MSA_NewOrleans_G	8784	4.4	6980	79%
	VAP_7_G	6936		VAP_33_MSA_DC_L	8784	4.4	5395	61%
VACAR	CPLE_1_MSA_Durham_G	7843	PJM	VAP_15_MSA_VB-Norfolk_L	8784	4.4	6487	74%
	AEP_8_GEN_Amos01_G			TVA_5_MSA_Nashville_L	8541	4.4	6030	69%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_7_MSA_Miami_L	8784	4.4	4272	49%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.3	6936	79%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_3_MSA_Miami_L	8784	4.3	4282	49%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_7_MSA_Miami_L	8784	4.3	5129	58%
	SOCO_26_MSA_Macon_G			EES_5_MSA_NewOrleans_G	8784		7077	81%
	VAP_7_G	6936		VAP_27_MSA_DC_L	8784	4.2	5395	61%
	FPC_2_MSA_HomosassaSpring		FRCC	FPL_3_MSA_Miami_L	8784	4.2	5135	58%
	NIPS_8_MSA_Chicago_G	8765	MISO	CIN_7_MSA_Lafayette_L	8784	4.2	1347	15%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_7_NYG	7979	4.2	6185	70%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_13_MSA_Chicago_L	8784	4.1	5793	66%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8775	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.1	7012	80%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_3_MSA_Chicago_L	8784	4.1	5794	66%
MISO	AMRN_12_MSA_StLouis_L	6699	MISO	AMRN_2_County_Macon_L	8784	4.1	3790	43%
	SOCO_32_MSA_Pascagoula_G			EES_5_MSA_NewOrleans_G	8784	4.1	6656	76%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	4.1	4345	49%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name		Market Area		Hours	Differential	Hours	U90 %
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	4.0	5254	60%
SPP	WERE_1_MSA_Manhattan_G	8771	SPP	KACP_7_MSA_KansasCity_L	8784	4.0	3255	37%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_7_MSA_Memphis_L	8773	4.0	5323	61%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_10_RI	6570	4.0	8771	100%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	3.9	3891	44%
				AP_7_MSA_Hagerstown-				
	VAP_7_G	6936	PJM	Martinsburg_L	8784	3.9	5242	60%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	WEC_3_MSA_Milwaukee_G	6898	3.9	87	1%
NYPP	NYISO_3_NYC	8784	PJM	PSEG_8_MSA_NewYork_G	8784	3.9	7219	82%
				SOCO_32_MSA_Pascagoula_				
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN		1253	3.9	5883	67%
NEPOOL	NEPOOL_7_CT	7641	NYPP	NYISO_9_NYI	8467	3.8	8575	98%
	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_2_GEN_Albright3_L	8784	3.8	4635	53%
	NYISO_3_NYC	8784	PJM	PSEG_3_MSA_NewYork_L	8784	3.7	6771	77%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_2_GEN_Albright3_L	8784	3.7	4632	53%
	ITC_7_MSA_Monroe_G	8712	MISO	FE_5_MSA_Cleveland_L	6473	3.7	5499	63%
				SOCO_10_MSA_Albany-				
VACAR	DUK_9_MSA_Charlotte_G	8780	SOUTHERN	Valdosta_L	7519	3.6	363	4%
MISO	FE_9_MSA_Weirton_G	8571	PJM	AP_2_GEN_Albright3_L	8784	3.6	4618	53%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	SOUTHERN		7519	3.6	271	3%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_28_MSA_Birmingham_G		SOUTHERN		7519		277	3%
MISO	ITC_3_MSA_Detroit_G	8784	MISO	FE_5_MSA_Cleveland_L	6473	3.5	8397	96%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_26_MSA_Macon_G	8784	SOUTHERN	Valdosta_L	7519	3.5	438	5%
PJM	AEP_8_GEN_Amos01_G	8783	MISO	FE_5_MSA_Cleveland_L	6473	3.4	4043	46%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_31_MSA_Atlanta_G	8775	SOUTHERN	Valdosta_L	7519	3.3	275	3%
NEPOOL	NEPOOL_3_ME	3923	NEPOOL	NEPOOL_9_NWKST	8784	3.3	8769	100%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7531	SOUTHERN	Valdosta_L	7519	3.3	1382	16%
	NEPOOL_5_SEMA	8784	NYPP	NYISO_9_NYI	8467	3.2	8605	98%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
NYPP	NYISO_6_NYF	7469	NEPOOL	NEPOOL_9_NWKST	8784	3.2	8770	100%
NYPP	NYISO_3_NYC	8784		PSEG_5_MSA_Philadelphia_L	8784	3.0	7153	81%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	3.0	5784	66%
NEPOOL	NEPOOL_2_NH	8426	NEPOOL	NEPOOL_9_NWKST	8784	3.0	8780	100%
SPP	AEPW_9_MSA_MountPleasant_	7676	ENTERGY	EES_9_MSA_Russellville_G	6251	3.0	8735	99%
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_10_NYJ	8784	2.9	8783	100%
FRCC	SEC_6_MSA_Palatka_G	8160		FPL_2_MSA_FortMyers_G	8506	2.9	4261	49%
ENTERGY	EES_2_MSA_Batesville_G	8784	ENTERGY	EES_9_MSA_Russellville_G	6251	2.8	2323	26%
	AMRN_12_MSA_StLouis_L	6699	PJM	NI_13_MSA_Chicago_L	8784	2.8	5519	63%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	AEP_2_STA_TN-WV_L	8784	2.8	5272	60%
MISO	AMRN_12_MSA_StLouis_L	6699	PJM	NI_3_MSA_Chicago_L	8784	2.8	5341	61%
MISO	EKPC_8_MSA_Maysville_G	8784	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	2.8	5027	57%
FRCC	FPL_8_MSA_PortStLucie_G	8763	FRCC	FPL_7_MSA_Miami_L	8784	2.7	3402	39%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	2.7	5322	61%
FRCC	FPL_8_MSA_PortStLucie_G	8763	FRCC	FPL_3_MSA_Miami_L	8784	2.7	2924	33%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	2.7	3766	43%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	AEP_1_MSA_Lynchburg_G	8784	2.7	5897	67%
PJM	AEP_8_GEN_Amos01_G	8783	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	2.6	5862	67%
PJM	AEP_8_GEN_Amos01_G	8783	TVAUTHOR	TVA_7_MSA_Memphis_L	8773	2.6	5450	62%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	2.6	6207	71%
				EES_7_MSA_Beaumont-				
SPP	AEPW_9_MSA_MountPleasant_	7676	ENTERGY	PortArthur_G	6739	2.6	8728	99%
MISO	FE_9_MSA_Weirton_G	8571	PJM	AEP_2_STA_TN-WV_L	8784	2.6	5052	58%
PJM	NI_7_MSA_Rochelle_G	8784	MISO	WEC_3_MSA_Milwaukee_G	6898	2.6	4580	52%
MISO	FE_9_MSA_Weirton_G	8571	PJM	AEP_1_MSA_Lynchburg_G	8784	2.5	6050	69%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	MISO	LGEE_5_MSA_Lexington_L	8784	2.5	1148	13%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	VAP_33_MSA_DC_L	8784	2.4	3941	45%
				AEP_9_MSA_Canton-				
MISO	IPL_2_MSA_Jasper_G	8784	PJM	Massillon_L	8784	2.4	2435	28%
	AEP_8_GEN_Amos01_G	8783		AP_2_GEN_Albright3_L	8784	2.4	6148	70%
PJM	AEP_8_GEN_Amos01_G	8783		CPLE_1_MSA_Durham_G	941	2.4	6859	78%
SPP	AEPW_9_MSA_MountPleasant_			EES_1_MSA_Jackson_L	8784	2.4	8734	99%
SPP	AEPW_5_MSA_Tulsa_G	7426		EES_9_MSA_Russellville_G	6251	2.3	5900	67%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub I	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
PJM	PJM500_7_MSA_York-Hanover_	8784	PJM	VAP_7_G	1848	2.3	6627	75%
PJM	VAP_1_MSA_Richmond_G	8784		VAP_27_MSA_DC_L	8784		3044	35%
MISO	NIPS_8_MSA_Chicago_G	8765	PJM	NI_13_MSA_Chicago_L	8784	2.3	162	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	2.2	155	2%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	2.2	225	3%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	2.2	194	2%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_5_GEN_GEPCHY_L	8784	2.2	104	1%
MISO	NIPS_8_MSA_Chicago_G	8765	PJM	NI_3_MSA_Chicago_L	8784	2.2	5	0%
	SOCO_15_MSA_Birmingham_G		VACAR	SCPSA_2_MSA_Charleston_L	8784	2.2	2686	31%
NEPOOL	NEPOOL_3_ME		NEPOOL	NEPOOL_6_WCMA	8643		6854	78%
NEPOOL	NEPOOL_3_ME	3923	NEPOOL	NEPOOL_4_NEBOS	8691	2.2	6692	76%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_21_MSA_Atlanta_G	8765		15	0%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_2_MSA_FortMyers_G	8506	2.1	4246	48%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_6_MSA_Augusta- Richmond_L	8784	2.1	10	0%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	VACAR	SCPSA_2_MSA_Charleston_L	8784	2.1	2728	31%
MISO	ALTE_2_MSA_Madison_G		MISO	WEC_3_MSA_Milwaukee_G	6898	2.1	1867	21%
FRCC	SEC_6_MSA_Palatka_G	8160	FRCC	FPC_4_MSA_Tampa_L	8784	2.1	3971	45%
NYPP	NYISO_6_NYF	7469	NEPOOL	NEPOOL_6_WCMA	8643	2.1	7183	82%
NYPP	NYISO_6_NYF			NEPOOL_4_NEBOS	8691	2.0	7210	82%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_2_MSA_FortMyers_G	8506	2.0	4967	57%
	SOCO_26_MSA_Macon_G			SCPSA_2_MSA_Charleston_L	8784	2.0	1133	13%
FRCC	FPC_10_MSA_Lakeland_G	8021	FRCC	FPL_7_MSA_Miami_L	8784	2.0	4293	49%
SPP	AEPW_5_MSA_Tulsa_G	7426	ENTERGY	EES_7_MSA_Beaumont- PortArthur_G	6739	2.0	6181	70%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				AP_7_MSA_Hagerstown-				
PJM	VAP_1_MSA_Richmond_G	8784	PJM	Martinsburg_L	8784	2.0	4615	53%
FRCC	FPC_10_MSA_Lakeland_G	8021	FRCC	FPL_3_MSA_Miami_L	8784	1.9	4292	49%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8775	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.9	2717	31%
	SOCO_32_MSA_Pascagoula_G			SCPSA_2_MSA_Charleston_L	8784		4297	49%
	NEPOOL_2_NH			NEPOOL_6_WCMA	8643	1.9	6868	78%
	NEPOOL_2_NH			NEPOOL_4_NEBOS	8691	1.8	6695	76%
	IESO_15_G			NYISO_2_NYB	8784		8449	96%
PJM	PJM500_4_MSA_Philadelphia_G	8374		VAP_7_G	1848		5933	68%
	IESO_6_G			NYISO_2_NYB	8784		8460	96%
	IESO_7_G			NYISO_2_NYB	8784		8528	97%
	PJM500_5_MSA_DC_G	8784		VAP_7_G	1848	1.8	5260	60%
	NEPOOL_7_CT	7641	NEPOOL	NEPOOL_9_NWKST	8784	1.7	8754	100%
	AEPW_5_MSA_Tulsa_G			EES_1_MSA_Jackson_L	8784	1.7	5562	63%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	ITC_2_MSA_Detroit_L	8541	1.7	7045	80%
MISO	LGEE_3_GEN_Gehnt2_G	8784	MISO	CIN_1_MSA_Indianapolis_L	8784	1.7	4263	49%
	SCEG_1_MSA_Columbia_G		SOUTHERN	_	7519		445	5%
	FE_9_MSA_Weirton_G			ITC_2_MSA_Detroit_L	8541	1.6	6876	78%
	NYISO_8_NYH			NYISO_9_NYI	8467	1.6	6506	74%
	NI_2_MSA_Chicago_G			AMRN_2_County_Macon_L	8784		4280	49%
PJM	DPL_8_GEN_Killen_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	1.6	1917	22%
	SCPSA_10_MSA_Charleston_G			SCPSA_2_MSA_Charleston_L	8784		2236	25%
	FPC_2_MSA_HomosassaSpring		FRCC	TECO_7_MSA_Tampa_L	8784		3645	41%
MISO	EKPC_8_MSA_Maysville_G	8784		AEP_2_STA_TN-WV_L	8784		1411	16%
PJM	DPL_8_GEN_Killen_G	8784		AEP_1_MSA_Lynchburg_G	8784		3115	35%
MISO	CIN_3_MSA_TerreHaute_G	7034		AEP_2_STA_TN-WV_L	8784		3844	44%
PJM	NI_15_MSA_Davenport_G		MISO	WEC_7_MSA_Milwaukee_G	8069		4719	54%
PJM	NI_6_MSA_Chicago_G	8111	MISO	AMRN_2_County_Macon_L	8784	1.4	4234	48%
ENTERGY	EES_4_GEN_Ouachita_G	5418	ENTERGY	EES_5_MSA_NewOrleans_G	8784	1.4	6326	72%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
PJM	AEP_8_GEN_Amos01_G	8783	PJM	AEP_2_STA_TN-WV_L	8784	1.3	9	0%
	CIN_3_MSA_TerreHaute_G	7034	PJM	AEP_1_MSA_Lynchburg_G	8784	1.3	3172	36%
	IESO_15_G	8382	MISO	ITC_2_MSA_Detroit_L	8541	1.3	8708	99%
	VAP_7_G	6936	PJM	VAP_15_MSA_VB-Norfolk_L	8784		5475	62%
NEPOOL	NEPOOL_3_ME	3923	NYPP	NYISO_7_NYG	7979	1.3	6712	76%
ONTARIO	IESO_6_G	8784	MISO	ITC_2_MSA_Detroit_L	8541	1.3	8718	99%
	IESO_7_G	8784	MISO	ITC_2_MSA_Detroit_L	8541	1.3	8724	99%
	DLCO_7_MSA_Pittsburgh_G			FE_4_MSA_Akron_L	8784	1.3	1832	21%
PJM	PJM500_4_MSA_Philadelphia_G	8374		PSEG_8_MSA_NewYork_G	8784	1.3	7112	81%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784		3712	42%
PJM	PL_8_MSA_Allentown_G	6898	PJM	JCPL_1_MSA_NewYork_L	8784	1.2	7808	89%
PJM	AEP_8_GEN_Amos01_G	8783	PJM	AEP_1_MSA_Lynchburg_G	8784	1.2	3206	36%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8671	VACAR	SCEG_9_MSA_Charleston_G	8494	1.2	2815	32%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPC_4_MSA_Tampa_L	8784	1.2	2706	31%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_7_MSA_Memphis_L	8773	1.2	3294	38%
NYPP	NYISO_6_NYF	7469	NYPP	NYISO_7_NYG	7979	1.2	5038	57%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_4_MSA_Akron_L	8784	1.2	1792	20%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	ITC_9_MSA_Detroit_L	8784	1.2	7682	87%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	VACAR	SCEG_9_MSA_Charleston_G	8494	1.2	2841	32%
NEPOOL	NEPOOL_5_SEMA	8784	NEPOOL	NEPOOL_9_NWKST	8784	1.1	8755	100%
NEPOOL	NEPOOL_3_ME	3923	NEPOOL	NEPOOL_10_RI	6570	1.1	6688	76%
				AEP_9_MSA_Canton-				
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	Massillon_L	8784	1.1	5444	62%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	TVAUTHOR	TVA_5_MSA_Nashville_L	8541	1.1	120	1%
				AEP_9_MSA_Canton-				
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	Massillon_L	8784	1.1	4400	50%
PJM	PJM500_4_MSA_Philadelphia_G	8374	PJM	PSEG_3_MSA_NewYork_L	8784	1.1	7009	80%
MISO	FE_9_MSA_Weirton_G	8571	MISO	FE_4_MSA_Akron_L	8784	1.1	3548	40%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	1.1	1361	15%
TVALITHOD	TVA 1 MCA Chatt Hunts C	0700	SOUTHERN	SOCO 17 MSA Mobile G	6709	1.1	2782	200/
IVAUIHUR	TVA_1_MSA_Chatt-Hunts_G	8/82	SOUTHERN	SUCU_1/_WSA_WORLE_G	6709	1.1	2182	32%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2008R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	1.1	1411	16%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	1.1	1407	16%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	1.1	1327	15%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	VACAR	SCEG_9_MSA_Charleston_G	8494	1.1	2773	32%
MISO	FE_9_MSA_Weirton_G	8571	MISO	ITC_9_MSA_Detroit_L	8784	1.1	7579	86%
MAPP	MEC_3_MSA_DesMoines_G	7991	MAPP	OPPD_5_MSA_Omaha_L	8784	1.0	2138	24%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_9_MSA_Canton-Massillor	8784	1.0	4355	50%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_21_MSA_Atlanta_G	8765	1.0	1238	14%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Sink			Congestion	Indicators				
		Source			Sink	Price	U90	
		Hours			Hours	Differential	Hours	U90 %
	NYISO_1_NYA	8272	NEPOOL	NEPOOL_7_CT			6671	76%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_11_NYK	8784	35.1	6676	76%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_11_NYK	8784	35.1	6676	76%
ONTARIO	IESO_15_G	8385	NYPP	NYISO_11_NYK	8784	35.1	6676	76%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_10_NYJ	8784	33.6	8784	100%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_10_NYJ	8784	33.6	8784	100%
ONTARIO	IESO_15_G	8385	NYPP	NYISO_10_NYJ	8784	33.6	8784	100%
ONTARIO	IESO_6_G			NYISO_9_NYI	8467	31.9	6667	76%
ONTARIO	IESO_7_G	8784			8467	31.9	6668	76%
	IESO_15_G	8385	NYPP	NYISO_9_NYI	8467	31.9	6666	76%
NYPP	NYISO_1_NYA	8272	NYPP	NYISO_11_NYK	8784	31.6	6676	76%
	MEC_3_MSA_DesMoines_G	7974	MISO	AMRN_12_MSA_StLouis_L	2086	30.6	3889	44%
NYPP	NYISO_1_NYA	8272	NYPP	NYISO_10_NYJ	8784	30.1	8784	100%
NYPP	NYISO_1_NYA	8272	NYPP	NYISO_9_NYI	8467	28.5	6591	75%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_7_NYG	8388	27.2	6665	76%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_7_NYG	8388	27.2	6666	76%
	IESO_15_G	8385		NYISO_7_NYG	8388		6664	76%
	NI_15_MSA_Davenport_G	8664	MISO	AMRN_12_MSA_StLouis_L	2086		5041	57%
MISO	OTP_9_GEN_BigStone_G	8784	MISO	XEL_3_MSA_Minneapolis_G	4678	26.5	7790	89%
PJM	PENELEC_2_MSA_DuBois_G	8404	NYPP	NYISO_11_NYK	8784	25.8	6676	76%
				OKGE_4_MSA_OklahomaCity				
SPP	WERE_1_MSA_Manhattan_G	8753	SPP	_L	8783	25.5	8317	95%
PJM	NI_7_MSA_Rochelle_G			AMRN_12_MSA_StLouis_L	2086		5648	64%
PJM	PENELEC_2_MSA_DuBois_G			NYISO_10_NYJ	8784	24.4	6675	76%
NYPP	NYISO_1_NYA			NYISO_7_NYG	8388	23.7	6511	74%
NYPP	NYISO_1_NYA		NEPOOL	NEPOOL_9_NWKST	8784		6681	76%
PJM	PENELEC_2_MSA_DuBois_G			NYISO_9_NYI	8467		6648	76%
NYPP	NYISO_3_NYC			NEPOOL_7_CT	1106		8771	100%
NYPP	NYISO_1_NYA			NEPOOL_6_WCMA	8762		6671	76%
NYPP	NYISO_1_NYA	8272	NEPOOL	NEPOOL_4_NEBOS	8656	21.3	6671	76%
	WERE_1_MSA_Manhattan_G	8753		WERE_4_GEN_Wolfcreek_G	3670		3405	39%
PJM	NI_2_MSA_Chicago_G			AMRN_12_MSA_StLouis_L	2086		3553	40%
PJM	NI_6_MSA_Chicago_G	8068	MISO	AMRN_12_MSA_StLouis_L	2086	20.0	3560	41%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	EES_9_MSA_Russellville_G	2521	SPP	ONGE_4_IVIOA_ONIANOMIAONY _L	8783	19.9	4293	49%
	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_8_MSA_DC-VA-MD_L	8784	19.8	7979	91%
	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	19.7	7968	91%
	NYISO 1 NYA	8272	PJM	PSEG_8_MSA_NewYork_G	8784	19.6	8192	93%
MISO	FE_9_MSA_Weirton_G	8610	PJM	AP_8_MSA_DC-VA-MD_L	8784	19.6	7943	90%
NYPP	NYISO_1_NYA	8272	PJM	PSEG_3_MSA_NewYork_L	8784	19.4	8228	94%
NEPOOL	NEPOOL_3_ME	4348	NEPOOL	NEPOOL_7_CT	1106	19.4	7681	87%
PJM	NI_20_MSA_Chicago_G	7224	MISO	AMRN_12_MSA_StLouis_L	2086	19.4	3541	40%
MISO	IP_8_GEN_Clinton_G	8015	MISO	AMRN_12_MSA_StLouis_L	2086	19.3	1786	20%
MAPP	NPPD_4_GEN_Gentleman_G	8760	MAPP	OPPD_5_MSA_Omaha_L	8784	19.0	8403	96%
				AP_7_MSA_Hagerstown-				
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	Martinsburg_L	8784	19.0	7933	90%
	•			AP_7_MSA_Hagerstown-				
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	18.9	7921	90%
	-			AP_7_MSA_Hagerstown-				
MISO	FE_9_MSA_Weirton_G	8610	PJM	Martinsburg_L	8784	18.8	7901	90%
NEPOOL	NEPOOL_2_NH	8519	NEPOOL	NEPOOL_7_CT	1106	18.4	7696	88%
	NYISO_1_NYA	8272		PSEG_5_MSA_Philadelphia_L	8784		8248	94%
PJM	PENELEC_2_MSA_DuBois_G			NYISO_7_NYG	8388	17.9	6645	76%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	AP_8_MSA_DC-VA-MD_L	8784	17.5	8064	92%
MISO	IP_7_GEN_Baldwin_G	8784	MISO	AMRN_12_MSA_StLouis_L	2086	17.4	994	11%
	BREC_3_County_Webster_G		MISO	LGEE_5_MSA_Lexington_L	8784		7384	84%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	VAP_33_MSA_DC_L	8784	17.3	8124	92%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	VAP_27_MSA_DC_L	8784	17.1	8045	92%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	VAP_7_G	1879	17.0	6743	77%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_11_NYK	8784	16.9	8784	100%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	AP_7_MSA_Hagerstown-Martir	8784	16.7	8038	92%
NYPP	NYISO_6_NYF	7530	NEPOOL	NEPOOL_7_CT	1106	16.7	8750	100%
MISO	BREC_3_County_Webster_G			TVA_5_MSA_Nashville_L	8531	16.6	7778	89%
MISO	CIN_8_MSA_Evansville_G		MISO	AMRN_12_MSA_StLouis_L	2086	16.1	2278	26%
MISO	XEL_3_MSA_Minneapolis_G		MISO	GRE_4_MSA_Minneapolis_L	8784			0%
	NYISO_3_NYC			NYISO_10_NYJ	8784		8783	100%
NEPOOL	NEPOOL_5_SEMA	8784	NEPOOL	NEPOOL_7_CT	1106	15.3	2253	26%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	AMRN_12_MSA_StLouis_L	2086	15.2	5952	68%
SPP	AEPW_9_MSA_MountPleasant_	7978	SPP	OKGE_4_MSA_OklahomaCity_	8783	14.6	4889	56%
PJM	NI_15_MSA_Davenport_G	8664	PJM	AEP_1_MSA_Lynchburg_G	8784	14.6	6943	79%
MISO	AMRN_12_MSA_StLouis_L	6698	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	14.5	5379	61%
ENTERGY	EES_9_MSA_Russellville_G			EES_5_MSA_NewOrleans_G	8784		6842	78%
ENTERGY	EES_2_MSA_Batesville_G	8784	SPP	OKGE_4_MSA_OklahomaCity_	8783	14.5	6133	70%
	NI_15_MSA_Davenport_G	8664		AEP_2_STA_TN-WV_L	8784	14.5	6081	69%
NEPOOL	NEPOOL_3_ME	4348	NYPP	NYISO_11_NYK	8784	14.4	8782	100%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8781	MISO	AMRN_12_MSA_StLouis_L	2086	14.4	2912	33%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	Valdosta_L	7471	13.8	3444	39%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_9_NYI	8467	13.8	8697	99%
PJM	AEP_8_GEN_Amos01_G	8782	MISO	AMRN_12_MSA_StLouis_L	2086	13.7	748	9%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	VAP_15_MSA_VB-Norfolk_L	8784	13.6	8015	91%
PJM	NI_15_MSA_Davenport_G	8664	PJM	NI_6_MSA_Chicago_G	716	13.6	4732	54%
NEPOOL	NEPOOL_2_NH	8519	NYPP	NYISO_11_NYK	8784	13.4	8782	100%
SPP	AEPW_5_MSA_Tulsa_G	7478	SPP	OKGE_4_MSA_OklahomaCity_	8783	13.2	1445	16%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	716	13.2	4466	51%
	-							
MISO	WEC_1_MSA_Chicago_G	8784	MISO	METC_9_MSA_Kalamazoo_L	8784	13.0	5758	66%
NEPOOL	NEPOOL_3_ME	4348	NYPP	NYISO_10_NYJ	8784	12.9	8784	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	FRCC	FPL_7_MSA_Miami_L	8784	12.9	5718	65%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	FRCC	FPL_3_MSA_Miami_L	8784	12.8	5354	61%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_7_MSA_Miami_L	8784	12.7	5715	65%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_7_MSA_Miami_L	8784	12.6	5472	62%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_3_MSA_Miami_L	8784	12.6	5353	61%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_3_MSA_Miami_L	8784	12.6	5478	62%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	FRCC	FPL_7_MSA_Miami_L	8784	12.5	5712	65%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	FRCC	FPL_3_MSA_Miami_L	8784	12.4	5352	61%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	12.4	6582	75%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	12.3	6030	69%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8781	SPP	WERE_4_GEN_Wolfcreek_G	3670	12.3	7585	86%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
				AEP_9_MSA_Canton-				
PJM	NI_15_MSA_Davenport_G	8664	PJM	Massillon_L	8784	12.3	5265	60%
MAPP	MEC_3_MSA_DesMoines_G	7974	MISO	AMRN_2_County_Macon_L	8784	12.1	5616	64%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	FRCC	FPL_7_MSA_Miami_L	8784	12.0	5932	68%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	FRCC	FPL_3_MSA_Miami_L	8784	12.0	5600	64%
NEPOOL	NEPOOL_2_NH	8519	NYPP	NYISO_10_NYJ	8784	11.9	8784	100%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	BGE_9_MSA_Baltimore-Towso	8784	11.8	7936	90%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	METC_8_MSA_BayCity_G	8357	11.8	5988	68%
NYPP	NYISO_6_NYF	7530	NYPP	NYISO_11_NYK	8784	11.7	8783	100%
				SOCO_10_MSA_Albany-				
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	Valdosta_L	7471	11.7	5514	63%
PJM	AP_1_County_Harrison_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	11.7	7714	88%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	11.5	8695	99%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	11.4	7888	90%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_6_MSA_Chicago_G	716	11.4	4347	49%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	11.3	7790	89%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	11.3	7874	90%
NEPOOL	NEPOOL_3_ME	4348	NYPP	NYISO_9_NYI	8467	11.2	8756	100%
NEPOOL	NEPOOL_7_CT	7678	NYPP	NYISO_11_NYK	8784	11.1	8782	100%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	11.1	7861	89%
	ALTE_2_MSA_Madison_G	8616	PJM	NI_6_MSA_Chicago_G	716	11.0	5715	65%
MISO	AMRN_12_MSA_StLouis_L	6698	PJM	AEP_1_MSA_Lynchburg_G	8784	11.0	6810	78%
PJM	AP_1_County_Harrison_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	11.0	7555	86%
MISO	AMRN_12_MSA_StLouis_L	6698	PJM	AEP_2_STA_TN-WV_L	8784	10.9	6601	75%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	10.8	8419	96%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_33_MSA_DC_L	8784	10.8	7645	87%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784		Towson_L	8784	10.7	7814	89%
PJM	PJM500_3_MSA_Pittsburgh_G	8784		AP_8_MSA_DC-VA-MD_L	8784	10.6	7846	89%
	AP_1_County_Harrison_G	8784		VAP_27_MSA_DC_L	8784		7518	86%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	10.5	7794	89%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	Congestion Indicators		
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
NYPP	NYISO_1_NYA	8272	NEPOOL	NEPOOL_3_ME	4436	10.5	6795	77%	
				BGE_5_MSA_Baltimore-					
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	10.5	7802	89%	
	AP_1_County_Harrison_G	8784	PJM	VAP_7_G	1879	10.5	5619	64%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	FRCC	FPL_2_MSA_FortMyers_G	8513	10.5	5046	57%	
PJM	PENELEC_2_MSA_DuBois_G	8404	PJM	PL_7_MSA_Allentown_L	8784	10.5	7873	90%	
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_33_MSA_DC_L	8784	10.4	7940	90%	
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_11_NYK	8784	10.3	8782	100%	
NYPP	NYISO_8_NYH	8784	NEPOOL	NEPOOL_7_CT	1106	10.3	8753	100%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_2_MSA_FortMyers_G	8513	10.3	5045	57%	
NEPOOL	NEPOOL_2_NH	8519	NYPP	NYISO_9_NYI	8467	10.3	8780	100%	
NYPP	NYISO_6_NYF	7530	NYPP	NYISO_10_NYJ	8784	10.3	8783	100%	
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_2_MSA_FortMyers_G	8513	10.2	5196	59%	
				AP_7_MSA_Hagerstown-					
PJM	AP_1_County_Harrison_G	8784	PJM	Martinsburg_L	8784	10.2	7518	86%	
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_27_MSA_DC_L	8784	10.2	7686	88%	
PJM	PJM500_7_MSA_York-Hanover_	8784	PJM	PECO_5_MSA_Philadelphia_L	6595	10.1	3504	40%	
				AEP_9_MSA_Canton-					
PJM	NI_7_MSA_Rochelle_G	8784	PJM	Massillon_L	8784	10.1	5526	63%	
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	FRCC	FPL_2_MSA_FortMyers_G	8513	10.1	5045	57%	
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_7_G	1879	10.1	6804	77%	
	NIPS_8_MSA_Chicago_G	8764	PJM	AEP_1_MSA_Lynchburg_G	8784	10.1	4780	54%	
MISO	AMRN_12_MSA_StLouis_L	6698	PJM	NI_6_MSA_Chicago_G	716		5498	63%	
	NIPS_8_MSA_Chicago_G	8764	PJM	AEP_2_STA_TN-WV_L	8784	10.0	1408	16%	
MISO	ALTE_2_MSA_Madison_G		MISO	XEL_3_MSA_Minneapolis_G	4678	9.9	2351	27%	
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	9.9	7887	90%	
				AP_7_MSA_Hagerstown-					
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	9.8	7816	89%	
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	9.7	3428	39%	
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	9.7	3452	39%	
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	9.7	3454	39%	

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	EES_9_MSA_Russellville_G	2521		SOCO_5_GEN_GEPCHY_L	8784	9.7	3387	39%
				SOCO_6_MSA_Augusta-				
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	Richmond_L	8784	9.7	2899	33%
	EES_9_MSA_Russellville_G			SOCO_21_MSA_Atlanta_G	8768		3379	38%
	SOCO_32_MSA_Pascagoula_G			FPL_2_MSA_FortMyers_G	8513		5320	61%
	LGEE_3_GEN_Gehnt2_G			LGEE_5_MSA_Lexington_L	8784		4107	47%
	PJM500_9_MSA_Pittsburgh_G	8784		VAP_33_MSA_DC_L	8784		8041	92%
	NEPOOL_7_CT			NYISO_10_NYJ	8784		8780	100%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	FRCC	FPC_4_MSA_Tampa_L	8784	9.5	4856	55%
	BGE_7_MSA_Baltimore-Towson	8212		PECO_5_MSA_Philadelphia_L	6595		4679	53%
	PJM500_9_MSA_Pittsburgh_G	8784		VAP_27_MSA_DC_L	8784		7633	87%
	PJM500_9_MSA_Pittsburgh_G	8784		VAP_7_G	1879		7000	80%
	SOCO_28_MSA_Birmingham_G			FPC_4_MSA_Tampa_L	8784		4859	55%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPC_4_MSA_Tampa_L	8784	9.3	5011	57%
SPP	AEPW_9_MSA_MountPleasant_	7978	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9.2	8744	100%
PJM	PJM500_4_MSA_Philadelphia_G	8397	PJM	PECO_5_MSA_Philadelphia_L	6595	9.1	5	0%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	FRCC	FPC_4_MSA_Tampa_L	8784	9.1	4860	55%
MISO	NIPS_8_MSA_Chicago_G	8764	PJM	NI_6_MSA_Chicago_G	716	9.1	13	0%
				AP_7_MSA_Hagerstown-				
	PJM500_9_MSA_Pittsburgh_G	8784		Martinsburg_L	8784	9.0	7880	90%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_7_NYG	8388	9.0	5975	68%
ENTEROY	FFC O MCA Dugodhillo C	2524	COLITHEDA	COCO 47 MCA Mahila C	6720	0.0	2200	200/
ENTERGY MISO	EES_9_MSA_Russellville_G			SOCO_17_MSA_Mobile_G	6738	8.9 8.9	3389	39%
	LGEE_3_GEN_Gehnt2_G			TVA_5_MSA_Nashville_L	8531		6303	72%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046		FPL_7_MSA_Miami_L	8784	8.9	5740	65%
ENTEROY	FFO O MOA Burealleille O	0504		EES_7_MSA_Beaumont-	7005		0.570	750/
	EES_9_MSA_Russellville_G			PortArthur_G	7005		6572	75%
	NEPOOL_5_SEMA			NYISO_10_NYJ	8784		8781	100%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_9_NWKST	8784	8.8	8771	100%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_17_MSA_Mobile_G			FPL_3_MSA_Miami_L	8784	8.8	5381	61%
ENTERGY	EES_9_MSA_Russellville_G	2521	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	8.8	6019	69%
				AEP_9_MSA_Canton-				
	AMRN_12_MSA_StLouis_L	6698		Massillon_L	8784		5990	68%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	FRCC	FPC_4_MSA_Tampa_L	8784	8.7	5162	59%
	AEPW_5_MSA_Tulsa_G	7478		WERE_4_GEN_Wolfcreek_G	3670		4615	53%
NYPP	NYISO_6_NYF			NYISO_9_NYI	8467	8.6	8657	99%
VACAR	CPLE_1_MSA_Durham_G	7851		VAP_33_MSA_DC_L	8784		7483	85%
VACAR	CPLE_1_MSA_Durham_G	7851		VAP_27_MSA_DC_L	8784		7123	81%
MISO	BREC_3_County_Webster_G			LGEE_9_MSA_Louisville_G	8784		7320	83%
	EES_9_MSA_Russellville_G			EES_1_MSA_Jackson_L	8784	_	2739	31%
PJM	NI_15_MSA_Davenport_G			AMRN_2_County_Macon_L	8784		5642	64%
VACAR	CPLE_1_MSA_Durham_G	7851		VAP_7_G	1879		5425	62%
PJM	NI_2_MSA_Chicago_G	8784		AEP_1_MSA_Lynchburg_G	8784		5514	63%
PJM	NI_2_MSA_Chicago_G	8784		AEP_2_STA_TN-WV_L	8784		2451	28%
PJM	NI_6_MSA_Chicago_G	8068		AEP_1_MSA_Lynchburg_G	8784		5524	63%
NEPOOL	NEPOOL_7_CT		NYPP	NYISO_9_NYI	8467	7.9	8633	98%
PJM	NI_6_MSA_Chicago_G	8068	PJM	AEP_2_STA_TN-WV_L	8784	7.9	2458	28%
SPP	AEPW_5_MSA_Tulsa_G	7478		EES_5_MSA_NewOrleans_G	8784	7.9	7692	88%
				AEP_9_MSA_Canton-				
	NIPS_8_MSA_Chicago_G	8764		Massillon_L	8784		1446	16%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	FRCC	FPC_3_MSA_Orlando_L	8784	7.8	4315	49%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	7.6	5488	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	7.6	5495	63%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	7.6	5502	63%
T) / A L IT L O.D.	TVA 4 MOA OLESES THE O	0040	COLITUEDS	SOOO F OFN OFFICIAL	0704	7.0	E 400	2004
IVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	7.6	5423	62%
TV/ALITUOD	TVA 4 MOA OLES ESTE O	0040	COLITUEDA	SOCO_6_MSA_Augusta-	0704	7.0	E 40 4	2001
IVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	KICHMONO_L	8784	7.6	5434	62%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_21_MSA_Atlanta_G	8768	7.6	5468	62%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPC_3_MSA_Orlando_L	8784	7.6	4316	49%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPC_3_MSA_Orlando_L	8784	7.5	4497	51%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	LGEE_5_MSA_Lexington_L	8784	7.4	5249	60%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	FRCC	FPC_3_MSA_Orlando_L	8784	7.4	4313	49%
MISO	AMRN_12_MSA_StLouis_L	6698	MISO	CIN_1_MSA_Indianapolis_L	8784	7.3	5961	68%
PJM	NI_20_MSA_Chicago_G	7224	PJM	AEP_1_MSA_Lynchburg_G	8784	7.3	5407	62%
NYPP	NYISO_1_NYA	8272	NEPOOL	NEPOOL_2_NH	265	7.3	6795	77%
PJM	NI_20_MSA_Chicago_G	7224	PJM	AEP_2_STA_TN-WV_L	8784	7.2	4430	50%
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_9_NYI	8467	7.2	8648	98%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_6_NYF	1254	7.2	6643	76%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_6_NYF	1254	7.2	6644	76%
ONTARIO	IESO_15_G	8385	NYPP	NYISO_6_NYF	1254	7.1	6638	76%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_15_MSA_VB-Norfolk_L	8784	7.1	7565	86%
PJM	NI_2_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	716	7.1	0	0%
				SOCO_32_MSA_Pascagoula_				
ENTERGY	EES_9_MSA_Russellville_G	2521	SOUTHERN	G	1396	7.0	3198	36%
	LGEE_3_GEN_Gehnt2_G			TVA_3_MSA_Knoxville_L	8784		4977	57%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	FRCC	FPC_3_MSA_Orlando_L	8784		4761	54%
	EES_9_MSA_Russellville_G	2521	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	6.9	3400	39%
	LGEE_3_GEN_Gehnt2_G			TVA_7_MSA_Memphis_L	8769	6.9	5112	58%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_6_WCMA	8762	6.8	8320	95%
	TVA_4_MSA_Clarksville_G	8616		SOCO_17_MSA_Mobile_G	6738		5863	67%
	NI_15_MSA_Davenport_G	8664	_		8784		4747	54%
ENTERGY	EES_9_MSA_Russellville_G	2521	TVAUTHOR	TVA_7_MSA_Memphis_L	8769	6.8	960	11%
PJM	NI_15_MSA_Davenport_G	8664	PJM	NI_3_MSA_Chicago_L	8784	6.7	4745	54%
PJM	PJM500_3_MSA_Pittsburgh_G	8784	PJM	VAP_15_MSA_VB-Norfolk_L	8784	6.7	7717	88%
SPP	WERE_1_MSA_Manhattan_G	8753		AEPW_1_MSA_Tulsa_G	7440	6.7	8644	98%
	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	6.7	5959	68%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_4_NEBOS	8656	6.6	8770	100%
	TVA_4_MSA_Clarksville_G			EES_9_MSA_Russellville_G	6263		5847	67%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046	FRCC	FPL_2_MSA_FortMyers_G	8513	6.5	5068	58%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name		Market Area		Hours	Differential	Hours	U90 %
NEPOOL	NEPOOL_3_ME	4348	NYPP	NYISO_7_NYG	8388	6.5	6499	74%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_13_MSA_Chicago_L	8784	6.4	4466	51%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_3_MSA_Chicago_L	8784	6.4	4466	51%
MISO	NIPS_8_MSA_Chicago_G	8764	MISO	CIN_1_MSA_Indianapolis_L	8784	6.4	1302	15%
NEPOOL	NEPOOL_3_ME	4348	NEPOOL	NEPOOL_9_NWKST	8784	6.3	8768	100%
PJM	NI_20_MSA_Chicago_G	7224		NI_6_MSA_Chicago_G	716	6.3	0	0%
MISO	IP_8_GEN_Clinton_G	8015	PJM	NI_6_MSA_Chicago_G	716	6.3	175	2%
				SOCO_10_MSA_Albany-				
	TVA_1_MSA_Chatt-Hunts_G		SOUTHERN		7471	6.2	112	1%
	EKPC_8_MSA_Maysville_G			LGEE_5_MSA_Lexington_L	8784	6.1	1318	15%
PJM	NI_7_MSA_Rochelle_G	8784	MISO	AMRN_2_County_Macon_L	8784	6.0	5606	64%
ENTERGY	EES_8_MSA_BatonRouge_G	8520	ENTERGY	EES_5_MSA_NewOrleans_G	8784	6.0	5115	58%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	VAP_15_MSA_VB-Norfolk_L	8784	5.9	7791	89%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	MISO	FE_5_MSA_Cleveland_L	6258	5.9	4548	52%
	LAGN_1_MSA_BatonRouge_G	8784		EES_5_MSA_NewOrleans_G	8784		6328	72%
PJM	AEP_8_GEN_Amos01_G			LGEE_5_MSA_Lexington_L	8784		21	0%
FRCC	SEC_6_MSA_Palatka_G			FPL_7_MSA_Miami_L	8784	5.9	4875	55%
PJM	AEP_8_GEN_Amos01_G			DUK_8_MSA_Charlotte_L	8784		3587	41%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_5_MSA_Cleveland_L	6258	5.8	4483	51%
FRCC	SEC_6_MSA_Palatka_G	8160	FRCC	FPL_3_MSA_Miami_L	8784	5.8	4890	56%
ENTERGY	AECI_4_GEN_NewMadrid1_G			TVA_5_MSA_Nashville_L	8531	5.8	4801	55%
MISO	CIN_3_MSA_TerreHaute_G			LGEE_5_MSA_Lexington_L	8784		154	2%
MISO	FE_9_MSA_Weirton_G	8610		FE_5_MSA_Cleveland_L	6258	5.8	3808	43%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8784		Massillon_L	8784		2484	28%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8781	ENTERGY	EES_9_MSA_Russellville_G	6263	5.7	4595	52%
				AEP_9_MSA_Canton-				
PJM	NI_6_MSA_Chicago_G	8068	PJM	Massillon_L	8784	5.6	2490	28%
PJM	AEP_8_GEN_Amos01_G	8782	VACAR	DUK_4_MSA_Greenville_L	6750	5.6	5157	59%
ENTERGY	EES_10_MSA_Vicksburg_G	8088	ENTERGY	EES_5_MSA_NewOrleans_G	8784	5.6	6337	72%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046	FRCC	FPC_4_MSA_Tampa_L	8784	5.5	4874	55%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
	NEPOOL_2_NH	8519	NYPP	NYISO_7_NYG	8388	5.5	7138	81%
MISO	EKPC_8_MSA_Maysville_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	5.3	5659	64%
NEPOOL	NEPOOL_2_NH	8519	NEPOOL	NEPOOL_9_NWKST	8784	5.3	8778	100%
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_11_NYK	8784	5.3	8783	100%
MISO	LGEE_3_GEN_Gehnt2_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	5.3	4150	47%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_7_MSA_Miami_L	8784	5.2	4421	50%
PJM	AEP_8_GEN_Amos01_G	8782	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	5.1	5937	68%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_3_MSA_Miami_L	8784	5.1	4438	51%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	ENTERGY	EES_5_MSA_NewOrleans_G	8784	5.1	6967	79%
PJM	VAP_7_G	6905	PJM	AP_8_MSA_DC-VA-MD_L	8784	5.1	5237	60%
FRCC	FPC_2_MSA_HomosassaSpring	8784		FPL_7_MSA_Miami_L	8784	5.0	5213	59%
				AEP_9_MSA_Canton-				
PJM	NI_20_MSA_Chicago_G	7224	PJM	Massillon_L	8784	5.0	2485	28%
NYPP	NYISO_3_NYC	8784	PJM	PSEG_8_MSA_NewYork_G	8784	5.0	7706	88%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_3_MSA_Miami_L	8784	5.0	5214	59%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_32_MSA_Pascagoula_(	1396	4.9	5905	67%
PJM	NI_15_MSA_Davenport_G	8664	MISO	WEC_3_MSA_Milwaukee_G	6881	4.9	4104	47%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	Valdosta_L	7471	4.9	1223	14%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.9	6923	79%
	SOCO_26_MSA_Macon_G	8784		EES_5_MSA_NewOrleans_G	8784		7057	80%
	VAP_7_G	6905	PJM	VAP_33_MSA_DC_L	8784	4.8	5256	60%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	4.8	5226	59%
VACAR	CPLE_1_MSA_Durham_G	7851	PJM	VAP_15_MSA_VB-Norfolk_L	8784	4.8	6370	73%
NYPP	NYISO_3_NYC	8784	PJM	PSEG_3_MSA_NewYork_L	8784	4.8	7319	83%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_2_GEN_Albright3_L	8784	4.7	4714	54%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.7	6987	80%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_2_GEN_Albright3_L	8784	4.7	4711	54%
	TVA_4_MSA_Clarksville_G	8616		TVA_7_MSA_Memphis_L	8769	4.7	5271	60%
	NI_7_MSA_Rochelle_G	8784		NI_13_MSA_Chicago_L	8784		4290	49%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub In	nformation		Sink Hub Info	ormation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MISO	AMRN_12_MSA_StLouis_L	6698	MISO	AMRN_2_County_Macon_L	8784	4.6	3648	42%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_3_MSA_Chicago_L	8784	4.6	4321	49%
MISO	FE_9_MSA_Weirton_G	8610	PJM	AP_2_GEN_Albright3_L	8784	4.6	4705	54%
PJM	VAP_7_G	6905	PJM	VAP_27_MSA_DC_L	8784	4.6	5249	60%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	4.6	3748	43%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	WEC_3_MSA_Milwaukee_G	6881	4.5	92	1%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	4.5	4239	48%
SPP	WERE_1_MSA_Manhattan_G	8753		KACP_7_MSA_KansasCity_L	8784	4.4	3283	37%
VACAR	DUK_9_MSA_Charlotte_G	8780	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7471	4.4	227	3%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	SOUTHERN		7471	4.4	104	1%
MISO	NIPS_8_MSA_Chicago_G	8764	MISO	CIN_7_MSA_Lafayette_L	8784	4.4	1315	15%
NEPOOL	NEPOOL_3_ME	4348	NEPOOL	NEPOOL_6_WCMA	8762	4.3	7127	81%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_13_MSA_Chicago_L	8784	4.3	5692	65%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	ENTERGY	EES_5_MSA_NewOrleans_G	8784	4.3	6642	76%
PJM	VAP_7_G	6905	PJM	AP_7_MSA_Hagerstown-Martir	8784	4.2	5115	58%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_3_MSA_Chicago_L	8784	4.2	5691	65%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L SOCO_10_MSA_Albany-	7471	4.2	109	1%
SOLITHEDN	SOCO_26_MSA_Macon_G	0701	SOUTHERN		7471	4.2	301	3%
	ITC 7 MSA Monroe G			FE_5_MSA_Cleveland_L	6258		5477	62%
	NEPOOL 3 ME			NEPOOL 4 NEBOS	8656		7025	80%
IVET OOL	IVET OOE_O_IVIE	7070	INLI OOL	SOCO_10_MSA_Albany-	0000	7.1	7020	0070
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	SOUTHERN		7471	4.0	107	1%
MISO	ITC_3_MSA_Detroit_G	8784	MISO	FE_5_MSA_Cleveland_L	6258	4.0	8350	95%
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_10_NYJ	8784	3.8	8784	100%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	3.8	6216	71%
NYPP	NYISO_6_NYF	7530	NYPP	NYISO_7_NYG	8388	3.8	5105	58%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046			8784	3.8	4360	50%
MISO	FE_9_MSA_Weirton_G	8610	PJM	AEP_1_MSA_Lynchburg_G	8784	3.7	6046	69%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	3.7	5389	61%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
NYPP	NYISO_1_NYA	8272	NYPP	NYISO_6_NYF	1254	3.7	6498	74%
PJM	AEP_8_GEN_Amos01_G	8782	MISO	FE_5_MSA_Cleveland_L	6258	3.7	4008	46%
MISO	FE_9_MSA_Weirton_G	8610	PJM	AEP_2_STA_TN-WV_L	8784	3.6	5146	59%
NYPP	NYISO_6_NYF	7530	NEPOOL	NEPOOL_9_NWKST	8784	3.6	8768	100%
				EES_7_MSA_Beaumont-				
SPP	AEPW_9_MSA_MountPleasant_	7978	ENTERGY	PortArthur_G	7005	3.6	8732	99%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_32_MSA_Pascagoula_G		SOUTHERN		7471	3.6	1195	14%
	EKPC_8_MSA_Maysville_G			TVA_3_MSA_Knoxville_L	8784		5029	57%
FRCC	SEC_6_MSA_Palatka_G	8160	FRCC	FPL_2_MSA_FortMyers_G	8513	3.5	4349	50%
SPP	AEPW_9_MSA_MountPleasant_	7978	ENTERGY	EES_9_MSA_Russellville_G	6263	3.4	8738	99%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	3.3	5690	65%
NEPOOL	NEPOOL_2_NH	8519	NEPOOL	NEPOOL_6_WCMA	8762	3.3	7124	81%
MISO	AMRN_12_MSA_StLouis_L	6698	PJM	NI_13_MSA_Chicago_L	8784	3.3	5484	62%
PJM	AEP_8_GEN_Amos01_G	8782	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	3.3	5789	66%
ENTERGY	EES_2_MSA_Batesville_G	8784	ENTERGY	EES_9_MSA_Russellville_G	6263	3.2	2262	26%
MISO	AMRN_12_MSA_StLouis_L	6698	PJM	NI_3_MSA_Chicago_L	8784	3.2	5318	61%
NYPP	NYISO_3_NYC	8784	PJM	PSEG_5_MSA_Philadelphia_L	8784	3.2	7610	87%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	3.2	3656	42%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	AEP_1_MSA_Lynchburg_G	8784	3.2	5806	66%
FRCC	FPL_8_MSA_PortStLucie_G	8747	FRCC	FPL_7_MSA_Miami_L	8784	3.1	3401	39%
NEPOOL	NEPOOL_7_CT	7678	NYPP	NYISO_7_NYG	8388	3.1	6168	70%
PJM	AEP_8_GEN_Amos01_G	8782	TVAUTHOR	TVA_7_MSA_Memphis_L	8769	3.1	5373	61%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	AEP_2_STA_TN-WV_L	8784	3.1	5246	60%
FRCC	FPL_8_MSA_PortStLucie_G	8747	FRCC	FPL_3_MSA_Miami_L	8784	3.1	2924	33%
NEPOOL	NEPOOL_2_NH	8519	NEPOOL	NEPOOL_4_NEBOS	8656	3.1	7017	80%
NEPOOL	NEPOOL_7_CT	7678	NEPOOL	NEPOOL_9_NWKST	8784	3.0	8753	100%
SPP	AEPW_9_MSA_MountPleasant_	7978	ENTERGY	EES_1_MSA_Jackson_L	8784	2.9	8737	99%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	VAP_33_MSA_DC_L	8784	2.9	3845	44%
PJM	NI_7_MSA_Rochelle_G		MISO	WEC_3_MSA_Milwaukee_G	6881	2.8	4508	51%
FRCC	JEA_6_MSA_Jacksonville_G		FRCC	FPL_2_MSA_FortMyers_G	8513	2.8	4333	49%
PJM	VAP_1_MSA_Richmond_G	8784		VAP_27_MSA_DC_L	8784		2913	33%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	VAP_7_G	1879	2.6	5448	62%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %	
	FPC_2_MSA_HomosassaSpring			FPL_2_MSA_FortMyers_G	8513		5026	57%	
	FE_6_MSA_Pittsburgh_G			ITC_2_MSA_Detroit_L	8540		7178	82%	
	AEP_8_GEN_Amos01_G	8782		AP_2_GEN_Albright3_L	8784		6176	70%	
	SEC_6_MSA_Palatka_G	8160	FRCC	FPC_4_MSA_Tampa_L	8784	2.5	4106	47%	
	FE_9_MSA_Weirton_G			ITC_2_MSA_Detroit_L	8540		7054	80%	
	ALTE_2_MSA_Madison_G		MISO	WEC_3_MSA_Milwaukee_G	6881		1753	20%	
PJM	PL_8_MSA_Allentown_G	6728	PJM	JCPL_1_MSA_NewYork_L	8784	2.4	7836	89%	
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_7_NYG	8388	2.4	6199	71%	
				AP_7_MSA_Hagerstown-					
	VAP_1_MSA_Richmond_G	8784		Martinsburg_L	8784		4553	52%	
	FPC_10_MSA_Lakeland_G	8028	FRCC	FPL_7_MSA_Miami_L	8784		4364	50%	
	NIPS_8_MSA_Chicago_G	8764		NI_13_MSA_Chicago_L	8784		161	2%	
FRCC	FPC_10_MSA_Lakeland_G	8028	FRCC	FPL_3_MSA_Miami_L	8784	2.3	4364	50%	
			_						
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623		SCPSA_2_MSA_Charleston_L	8784	2.3	2692	31%	
				AEP_9_MSA_Canton-					
	IPL_2_MSA_Jasper_G	8784		Massillon_L	8784		2329	27%	
	NIPS_8_MSA_Chicago_G	8764		NI_3_MSA_Chicago_L	8784		2	0%	
PJM	PJM500_4_MSA_Philadelphia_G	8397	PJM	PSEG_8_MSA_NewYork_G	8784	2.2	7557	86%	
				SOCO_10_MSA_Albany-					
	SCEG_1_MSA_Columbia_G		SOUTHERN		7471		308	4%	
NEPOOL	NEPOOL_5_SEMA	8784		NEPOOL_9_NWKST	8784	2.2	8753	100%	
				EES_7_MSA_Beaumont-					
SPP	AEPW_5_MSA_Tulsa_G	7478	ENTERGY	PortArthur_G	7005	2.2	6128	70%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	2.2	165	2%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	2.2	176	2%	
	TVA_1_MSA_Chatt-Hunts_G			SOCO_8_MSA_Atlanta_L	8784		211	2%	
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_9_NYI	8467	2.2	6666	76%	
T) / A L ITL I C C	T)/A 4 MOA Obast Units O	0700	COLITHERN	COOO 5 OFN OFDOLDY I	0704	0.4	70	407	
IVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	2.1	72	1%	

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	Market Area Hub Name Ho  TVAUTHOR TVA_1_MSA_Chatt-Hunts_G  TVAUTHOR TVA_1_MSA_Chatt-Hunts_G  SOUTHERN SOCO_28_MSA_Birmingham_G PJM PJM500_4_MSA_Philadelphia_G  SOUTHERN SOCO_26_MSA_Macon_G SPP AEPW_5_MSA_Tulsa_G PJM DPL_8_GEN_Killen_G  TVAUTHOR TVA_1_MSA_Chatt-Hunts_G			rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				SOCO_6_MSA_Augusta-				
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN		8784	2.1	6	0%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_21_MSA_Atlanta_G	8768	2.1	6	0%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	VACAR	SCPSA_2_MSA_Charleston_L	8784	2.1	2736	31%
PJM	PJM500_4_MSA_Philadelphia_G	8397	PJM	PSEG_3_MSA_NewYork_L	8784	2.0	7430	85%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	VACAR	SCPSA_2_MSA_Charleston_L	8784	2.0	1069	12%
SPP	AEPW_5_MSA_Tulsa_G	7478	ENTERGY	EES_9_MSA_Russellville_G	6263		5850	67%
		8784	PJM	AEP_1_MSA_Lynchburg_G	8784	1.9	3074	35%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	MISO	LGEE_5_MSA_Lexington_L	8784	1.9	1078	12%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.9	2713	31%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	TECO_7_MSA_Tampa_L	8784	1.9	3806	43%
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	ITC_9_MSA_Detroit_L	8784	1.9	7748	88%
PJM	DPL_8_GEN_Killen_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	1.9	1911	22%
MISO	FE_9_MSA_Weirton_G	8610	MISO	ITC_9_MSA_Detroit_L	8784	1.8	7668	87%
MISO	EKPC_8_MSA_Maysville_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	1.8	1479	17%
MISO	LGEE_3_GEN_Gehnt2_G	8784	MISO	CIN_1_MSA_Indianapolis_L	8784	1.7	4114	47%
PJM	NI_2_MSA_Chicago_G	8784	MISO	AMRN_2_County_Macon_L	8784	1.7	4060	46%
PJM	PJM500_8_MSA_Philadelphia_G	8784	PJM	PSEG_8_MSA_NewYork_G	8784	1.6	7550	86%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPC_4_MSA_Tampa_L	8784	1.6	2819	32%
PJM	AEP_8_GEN_Amos01_G	8782	PJM	AEP_1_MSA_Lynchburg_G	8784	1.6	3196	36%
NYPP	NYISO_6_NYF	7530	NEPOOL	NEPOOL_6_WCMA	8762	1.6	7463	85%
ONTARIO	IESO_6_G	8784	MISO	ITC_2_MSA_Detroit_L	8540	1.6	8717	99%
ONTARIO	IESO_7_G	8784	MISO	ITC_2_MSA_Detroit_L	8540	1.6	8725	99%
ONTARIO	IESO_15_G	8385	MISO	ITC_2_MSA_Detroit_L	8540	1.6	8703	99%
				AEP_9_MSA_Canton-				
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	Massillon_L	8784	1.6	4507	51%
	CIN_3_MSA_TerreHaute_G	7044	PJM	AEP_1_MSA_Lynchburg_G	8784	1.6	3183	36%
	NI_6_MSA_Chicago_G	8068		AMRN_2_County_Macon_L	8784	1.5	4018	46%
	AEP_8_GEN_Amos01_G	8782		AEP_2_STA_TN-WV_L	8784	1.5	2	0%
	AEPW_5_MSA_Tulsa_G	7478		EES_1_MSA_Jackson_L	8784		5552	63%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
	SCPSA_10_MSA_Charleston_G	8616	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.5	2261	26%	
MAPP	MEC_3_MSA_DesMoines_G	7974	MAPP	OPPD_5_MSA_Omaha_L	8784	1.5	2205	25%	
				AEP_9_MSA_Canton-					
	FE_6_MSA_Pittsburgh_G	8784	PJM	Massillon_L	8784	1.5	4457	51%	
PJM	DLCO_7_MSA_Pittsburgh_G	8616	MISO	FE_4_MSA_Akron_L	8784	1.5	1894	22%	
ONTARIO	IESO_6_G	8784	NYPP	NYISO_2_NYB	8784	1.5	8457	96%	
	IESO_7_G			NYISO_2_NYB	8784	1.5	8505	97%	
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	1.5	3620	41%	
MISO	CIN_3_MSA_TerreHaute_G	7044	PJM	AEP_2_STA_TN-WV_L	8784	1.5	3863	44%	
ONTARIO	IESO_15_G	8385	NYPP	NYISO_2_NYB	8784	1.5	8441	96%	
PJM	PJM500_8_MSA_Philadelphia_G	8784	PJM	PSEG_3_MSA_NewYork_L	8784	1.5	7423	85%	
PJM	NI_15_MSA_Davenport_G	8664	MISO	WEC_7_MSA_Milwaukee_G	8097	1.4	4640	53%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8623	VACAR	SCEG_9_MSA_Charleston_G	8439	1.4	2805	32%	
	•			AEP_9_MSA_Canton-					
MISO	FE_9_MSA_Weirton_G	8610	PJM	Massillon_L	8784	1.4	3963	45%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7388	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.4	4298	49%	
	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_4_MSA_Akron_L	8784	1.4	1849	21%	
NYPP	NYISO_6_NYF	7530	NEPOOL	NEPOOL_4_NEBOS	8656	1.4	7489	85%	
PJM	PJM500_4_MSA_Philadelphia_G	8397	PJM	JCPL_3_MSA_NewYork_L	8784	1.3	6116	70%	
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_7_MSA_Memphis_L	8769	1.3	3146	36%	
MISO	FE_9_MSA_Weirton_G	8610	MISO	FE_4_MSA_Akron_L	8784	1.3	3697	42%	
	DLCO_7_MSA_Pittsburgh_G	8616	MISO	FE_7_MSA_Toledo_L	8779	1.3	6268	71%	
	-								
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	SOUTHERN	SOCO_17_MSA_Mobile_G	6738	1.3	2772	32%	
ENTERGY	EES_4_GEN_Ouachita_G	5475	ENTERGY	EES_5_MSA_NewOrleans_G	8784	1.3	6334	72%	
	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_7_MSA_Toledo_L	8779	1.2	6211	71%	
	<u> </u>								
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	VACAR	SCEG_9_MSA_Charleston_G	8439	1.2	2820	32%	
SOUTHERN	SOCO_26_MSA_Macon_G	8784	VACAR	SCEG_9_MSA_Charleston_G	8439	1.2	2778	32%	

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2008R2

Source Hub I	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
MISO	FE_9_MSA_Weirton_G	8610	MISO	FE_7_MSA_Toledo_L	8779	1.2	5824	66%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	TVAUTHOR	TVA_5_MSA_Nashville_L	8531	1.2	124	1%
PJM	VAP_7_G	6905	PJM	VAP_15_MSA_VB-Norfolk_L	8784	1.1	5313	60%
ONTARIO	IESO_6_G			IESO_2_G	8715	1.1	4622	53%
ONTARIO	IESO_7_G			IESO_2_G	8715	1.1	5244	60%
ONTARIO	IESO_15_G	8385	ONTARIO	IESO_2_G	8715	1.1	8089	92%
SOUTHERN	SOCO_17_MSA_Mobile_G	2046	ENTERGY	EES_5_MSA_NewOrleans_G	8784	1.1	6819	78%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8782	ENTERGY	EES_9_MSA_Russellville_G	6263	1.1	1202	14%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	WEC_7_MSA_Milwaukee_G	8097	1.1	9	0%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8771	VACAR	SCEG_9_MSA_Charleston_G	8439	1.1	2819	32%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MAPP	MEC_3_MSA_DesMoines_G	8009	MISO	AMRN_12_MSA_StLouis_L	2082	20.5	4097	47%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_11_NYK	8784	18.9	6364	72%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_11_NYK	8784	18.9	6364	72%
ONTARIO	IESO_15_G	8396	NYPP	NYISO_11_NYK	8784	18.9	6364	72%
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_7_CT	1117	18.4	6361	72%
PJM	NI_15_MSA_Davenport_G	8670	MISO	AMRN_12_MSA_StLouis_L	2082	18.0	5766	66%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_10_NYJ	8784	17.8	8784	100%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_10_NYJ	8784	17.8	8784	100%
ONTARIO	IESO_15_G	8396	NYPP	NYISO_10_NYJ	8784	17.8	8784	100%
PJM	NI_7_MSA_Rochelle_G	8784	MISO	AMRN_12_MSA_StLouis_L	2082	16.9	6315	72%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_9_NYI	8467	16.6	6353	72%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_9_NYI	8467	16.6	6353	72%
ONTARIO	IESO_15_G	8396	NYPP	NYISO_9_NYI	8467	16.6	6353	72%
NYPP	NYISO_1_NYA	8323	NYPP	NYISO_11_NYK	8784	16.5	6364	72%
PJM	AEP_8_GEN_Amos01_G	8784	PJM	VAP_7_G	1371	16.4	6666	76%
MISO	OTP_9_GEN_BigStone_G	8784	MISO	XEL_3_MSA_Minneapolis_G	4678	16.0	8076	92%
NYPP	NYISO_1_NYA	8323	NYPP	NYISO_10_NYJ	8784	15.4	8784	100%
				OKGE_4_MSA_OklahomaCity				
	WERE_1_MSA_Manhattan_G	8739		_L	8773	15.3	8490	97%
NYPP	NYISO_1_NYA	8323	NYPP	NYISO_9_NYI	8467	14.2	6289	72%
	IESO_6_G	8784	NYPP	NYISO_7_NYG	8420	14.1	6351	72%
	IESO_7_G	8784	NYPP	NYISO_7_NYG	8420	14.1	6351	72%
ONTARIO	IESO_15_G		NYPP	NYISO_7_NYG	8420	14.1	6350	72%
PJM	NI_15_MSA_Davenport_G	8670	PJM	AEP_1_MSA_Lynchburg_G	8784	12.9	7290	83%
PJM	NI_15_MSA_Davenport_G	8670	PJM	AEP_2_STA_TN-WV_L	8784	12.5	6500	74%
	===		0.00					<b>2-</b> 2/
	WERE_1_MSA_Manhattan_G	8739		WERE_4_GEN_Wolfcreek_G	3632		3238	37%
	NPPD_4_GEN_Gentleman_G		MAPP	OPPD_5_MSA_Omaha_L	8784		8388	95%
NEPOOL	NEPOOL_3_ME		NEPOOL	NEPOOL_7_CT	1117		7545	86%
PJM	NI_2_MSA_Chicago_G		MISO	AMRN_12_MSA_StLouis_L	2082		3925	45%
PJM	PENELEC_2_MSA_DuBois_G		NYPP	NYISO_11_NYK	8784		6364	72%
PJM	NI_6_MSA_Chicago_G	8321	MISO	AMRN_12_MSA_StLouis_L	2082	11.9	3935	45%
<u></u>			<u></u>	AEP_9_MSA_Canton-				
PJM	NI_15_MSA_Davenport_G	8670	PJM	Massillon_L	8784	11.8	6037	69%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_7_CT	1117	11.8	8766	100%
	NI_7_MSA_Rochelle_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	11.7	7000	80%
NYPP	NYISO_1_NYA	8323	NYPP	NYISO_7_NYG	8420	11.7	6192	70%
PJM	NI_20_MSA_Chicago_G	7234	MISO	AMRN_12_MSA_StLouis_L	2082	11.7	3912	45%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_7_G	1371	11.6	5280	60%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_8_MSA_DC-VA-MD_L	8784	11.6	8009	91%
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	11.5	8003	91%
MISO	FE_9_MSA_Weirton_G	8628	PJM	AP_8_MSA_DC-VA-MD_L	8784	11.5	7970	91%
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	VAP_7_G	1371	11.4	6524	74%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	11.4	6397	73%
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_9_NWKST	8784	11.4	6370	73%
MISO	IP_8_GEN_Clinton_G	8011	MISO	AMRN_12_MSA_StLouis_L	2082	11.3	1664	19%
ENTERGY	EES 9 MSA Russellville G	2477	SDD	OKGE_4_MSA_OklahomaCity L	8773	11.3	3682	42%
PJM	PENELEC_2_MSA_DuBois_G		NYPP	NYISO_10_NYJ	8784		6364	72%
PJM	PJM500_9_MSA_Pittsburgh_G	8784		VAP_7_G	1371	11.2	6696	72% 76%
NYPP	NYISO_1_NYA	8323		PSEG 8 MSA NewYork G	8779		8163	93%
NIFF	NTISO_I_NTA	0323	PJIVI	AP_7_MSA_Hagerstown-	0119	11.1	0103	93%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	P.IM	Martinsburg_L	8784	11.1	7972	91%
	DEGG_7_ING/ C_I INGSGIGIT_G	0010		AP_7_MSA_Hagerstown-	0.01		7072	0170
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	Martinsburg_L	8784	11.0	7964	91%
				AP_7_MSA_Hagerstown-				
MISO	FE_9_MSA_Weirton_G	8628		 Martinsburg_L	8784	11.0	7935	90%
NYPP	NYISO 1 NYA	8323		PSEG_3_MSA_NewYork_L	8784		8179	93%
PJM	AEP_8_GEN_Amos01_G	8784		AP_8_MSA_DC-VA-MD_L	8784		8108	92%
VACAR	CPLE_1_MSA_Durham_G	7555		VAP_7_G	1371	10.7	5149	59%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	METC_9_MSA_Kalamazoo_L	8784	10.6	5773	66%
PJM	NI_7_MSA_Rochelle_G	8784		AEP_9_MSA_Canton- Massillon L	8784		6053	69%
	NEPOOL_3_ME		NYPP	NYISO_11_NYK	8784		8783	100%
PJM	AEP_8_GEN_Amos01_G	8784		VAP_33_MSA_DC_L	8784		8129	93%
NYPP	NYISO_1_NYA	8323	PJM	PSEG_5_MSA_Philadelphia_L	8784	10.5	8198	93%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_6_WCMA	8707	10.4	6361	72%
PJM	AEP_8_GEN_Amos01_G	8784	PJM	VAP_27_MSA_DC_L	8784	10.4	8079	92%
MISO	IP_7_GEN_Baldwin_G	8784	MISO	AMRN_12_MSA_StLouis_L	2082	10.4	1559	18%
				AP_7_MSA_Hagerstown-				
PJM	AEP_8_GEN_Amos01_G	8784	PJM	Martinsburg_L	8784	10.3	8048	92%
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_4_NEBOS	8631	10.3	6361	72%
MISO	BREC_3_County_Webster_G	8784	MISO	LGEE_5_MSA_Lexington_L	8784	10.2	7505	85%
NEPOOL	NEPOOL_2_NH	8501	NEPOOL	NEPOOL_7_CT	1117	10.0	7577	86%
MAPP	MEC_3_MSA_DesMoines_G	8009	MISO	AMRN_2_County_Macon_L	8784	10.0	6315	72%
PJM	PENELEC_2_MSA_DuBois_G	7753	NYPP	NYISO_9_NYI	8467	10.0	6334	72%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_11_NYK	8784	9.8	8784	100%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_5_MSA_Tulsa_G	7062	SPP	_L	8773	9.7	1940	22%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_9_MSA_MountPleasant_	6984	SPP	_L	8773	9.7	4330	49%
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_10_RI	6243	9.6	6361	72%
NEPOOL	NEPOOL_3_ME	3752	NYPP	NYISO_10_NYJ	8784	9.4	8781	100%
ENTERGY	EES_9_MSA_Russellville_G	2477	ENTERGY	EES_5_MSA_NewOrleans_G	8784	9.4	6807	77%
MISO	WEC_1_MSA_Chicago_G	8784	MISO	METC_8_MSA_BayCity_G	8119	9.4	5919	67%
NYPP	NYISO_6_NYF	7778	NEPOOL	NEPOOL_7_CT	1117	9.3	8747	100%
MISO	XEL_3_MSA_Minneapolis_G	4129	MISO	GRE_4_MSA_Minneapolis_L	8784	9.3	0	0%
MISO	AMRN_12_MSA_StLouis_L	6702	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	9.2	5377	61%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_9_MSA_Russellville_G	2477	SOUTHERN	Valdosta_L	7678	9.2	3674	42%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	MISO	AMRN_12_MSA_StLouis_L	2082	8.9	2732	31%
MISO	NIPS_8_MSA_Chicago_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8784	8.8	4899	56%
MISO	AMRN_12_MSA_StLouis_L	6702	PJM	AEP_1_MSA_Lynchburg_G	8784	8.8	7097	81%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_10_NYJ	8784	8.7	8782	100%
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_2_MSA_Batesville_G	8784	SPP	_L	8773	8.5	5518	63%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	AMRN_12_MSA_StLouis_L	2082	8.5	5995	68%
MISO	NIPS_8_MSA_Chicago_G	8760	PJM	AEP_2_STA_TN-WV_L	8784	8.5	1654	19%
MISO	AMRN_12_MSA_StLouis_L	6702	PJM	AEP_2_STA_TN-WV_L	8784	8.4	6856	78%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
	AEP_8_GEN_Amos01_G	8784		VAP_15_MSA_VB-Norfolk_L	8784	8.4	8049	92%
	NEPOOL_3_ME	3752	NYPP	NYISO_9_NYI	8467		8753	100%
	NEPOOL_5_SEMA			NEPOOL_7_CT	1117		2719	31%
MISO	CIN_8_MSA_Evansville_G			AMRN_12_MSA_StLouis_L	2082	8.1	2938	33%
NEPOOL	NEPOOL_2_NH	8501	NYPP	NYISO_11_NYK	8784	8.1	8783	100%
SPP	AEPW_5_MSA_Tulsa_G	7062	ENTERGY	EES_5_MSA_NewOrleans_G	8784	7.8	7708	88%
SPP	AEPW_9_MSA_MountPleasant_	6984	ENTERGY	EES_5_MSA_NewOrleans_G	8784	7.8	8748	100%
MISO	NIPS_8_MSA_Chicago_G	8760	PJM	AEP_9_MSA_Canton- Massillon_L	8784	7.7	1705	19%
MISO	AMRN_12_MSA_StLouis_L	6702		AEP_9_MSA_Canton- Massillon L	8784	7.6	6336	72%
	VAP_1_MSA_Richmond_G	8784	PJM	VAP_7_G	1371	7.6	5353	61%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7678	7.6	5424	62%
	LGEE_3_GEN_Gehnt2_G	8784	MISO	LGEE_5_MSA_Lexington_L	8784	7.5	4914	56%
	NI_15_MSA_Davenport_G	8670	MISO	AMRN_2_County_Macon_L	8784	7.5	6627	75%
	PENELEC_2_MSA_DuBois_G	7753		NYISO_7_NYG	8420		6333	72%
NYPP	NYISO_3_NYC	8784	NYPP	NYISO_9_NYI	8467	7.5	8692	99%
	EES_9_MSA_Russellville_G			SOCO_5_GEN_GEPCHY_L	8784		3708	42%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	FRCC	FPL_7_MSA_Miami_L	8784	7.5	5710	65%
	EES_9_MSA_Russellville_G			SOCO_8_MSA_Atlanta_L	8784		3787	43%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	FRCC	FPL_3_MSA_Miami_L	8783	7.4	5183	59%
ENTERGY	EES_9_MSA_Russellville_G	2477	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	7.4	3763	43%
	EES_9_MSA_Russellville_G			SOCO_16_MSA_Atlanta_L	8784		3508	40%
NYPP	NYISO_6_NYF	7778	NYPP	NYISO_11_NYK	8784	7.4	8784	100%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	SPP	WERE_4_GEN_Wolfcreek_G	3632	7.3	6992	80%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	EES_9_MSA_Russellville_G	2477	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776		3449	39%
MISO	BREC_3_County_Webster_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	7.3	7663	87%
				SOCO_6_MSA_Augusta-				
ENTERGY	EES_9_MSA_Russellville_G	2477	SOUTHERN		8784	7.2	3061	35%
PJM	NI_2_MSA_Chicago_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	7.2	5573	63%
NEPOOL	NEPOOL_2_NH	8501	NYPP	NYISO_10_NYJ	8784	7.0	8784	100%
	AEPW_5_MSA_Tulsa_G	7062		WERE_4_GEN_Wolfcreek_G	3632		3839	44%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	FRCC	FPL_7_MSA_Miami_L	8784	6.9	5394	61%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	FRCC	FPL_3_MSA_Miami_L	8783	6.9	4788	55%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_7_MSA_Miami_L	8784	6.8	5384	61%
	NI_2_MSA_Chicago_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	6.8	2757	31%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_3_MSA_Miami_L	8783	6.8	4786	54%
PJM	NI_15_MSA_Davenport_G	8670	PJM	NI_6_MSA_Chicago_G	463	6.8	5713	65%
PJM	NI_6_MSA_Chicago_G	8321	PJM	AEP_1_MSA_Lynchburg_G	8784	6.8	5586	64%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	Towson_L	8784	6.7	7768	88%
PJM	AP_1_County_Harrison_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	6.6	7474	85%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	MISO	LGEE_5_MSA_Lexington_L	8784	6.6	5187	59%
NEPOOL	NEPOOL_7_CT	7667	NYPP	NYISO_11_NYK	8784	6.6	8783	100%
PJM	NI_20_MSA_Chicago_G	7234	PJM	AEP_1_MSA_Lynchburg_G	8784	6.5	5619	64%
				BGE_10_MSA_Baltimore-				
	PJM500_3_MSA_Pittsburgh_G	8758		Towson_L	8784		7730	88%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_7_MSA_Miami_L	8784	6.4	4901	56%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	Towson_L	8784	6.4	7724	88%
PJM	NI_6_MSA_Chicago_G	8321	PJM	AEP_2_STA_TN-WV_L	8784	6.4	2758	31%
	-			BGE_9_MSA_Baltimore-				
	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	6.4	7694	88%
	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_3_MSA_Miami_L	8783	6.4	4913	56%
	PJM500_3_MSA_Pittsburgh_G	8758	PJM	PEPCO_1_MSA_DC_L	8784	6.4	7445	85%
	NI_7_MSA_Rochelle_G		MISO	AMRN_2_County_Macon_L	8784	6.4	6480	74%
	SOCO_31_MSA_Atlanta_G	8772	FRCC	FPL_7_MSA_Miami_L	8784	6.3	5380	61%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	AEP_8_GEN_Amos01_G	8784	MISO	AMRN_12_MSA_StLouis_L	2082	6.3	1056	12%
NYPP	NYISO_6_NYF	7778	NYPP	NYISO_10_NYJ	8784	6.3	8782	100%
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_11_NYK	8784	6.3	8783	100%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	FRCC	FPL_3_MSA_Miami_L	8783	6.3	4782	54%
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	PL_7_MSA_Allentown_L	8784	6.2	8676	99%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	6.2	7642	87%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	FRCC	FPL_2_MSA_FortMyers_G	8464	6.2	4850	55%
PJM	NI_20_MSA_Chicago_G	7234	PJM	AEP_2_STA_TN-WV_L	8784	6.2	4471	51%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	Towson_L	8784	6.1	7634	87%
PJM	AP_1_County_Harrison_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	6.1	7636	87%
MISO	NIPS_8_MSA_Chicago_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8784	6.1	1903	22%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PEPCO_1_MSA_DC_L	8784	6.1	7419	84%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8784	PJM	Massillon_L	8784	6.0	2858	33%
MISO	AMRN_12_MSA_StLouis_L	6702	MISO	CIN_1_MSA_Indianapolis_L	8784	6.0	6287	72%
PJM	NI_15_MSA_Davenport_G	8670	PJM	NI_3_MSA_Chicago_L	8784	5.9	5745	65%
PJM	NI_15_MSA_Davenport_G	8670	PJM	NI_13_MSA_Chicago_L	8784	5.9	5746	65%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	PL_7_MSA_Allentown_L	8784	5.9	8369	95%
TVAUTHOR	TVA_4_MSA_Clarksville_G			SOCO_5_GEN_GEPCHY_L	8784		5322	61%
MISO	ALTE_2_MSA_Madison_G	8616	MISO	XEL_3_MSA_Minneapolis_G	4678	5.9	2141	24%
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	AP_8_MSA_DC-VA-MD_L	8784	5.8	7723	88%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	5.8	5434	62%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	5.8	5382	61%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	5.8	5284	60%
NEPOOL	NEPOOL_2_NH			NYISO_9_NYI	8467		8773	100%
	AP_1_County_Harrison_G	8784		VAP_33_MSA_DC_L	8784		7654	87%
NEPOOL	NEPOOL_3_ME	3752	NYPP	NYISO_7_NYG	8420	5.8	6131	70%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776	5.7	5274	60%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	FRCC	FPC_4_MSA_Tampa_L	8784	5.7	4648	53%
PJM	AP_1_County_Harrison_G	8784	PJM	VAP_27_MSA_DC_L	8784	5.7	7581	86%
				SOCO_6_MSA_Augusta-				
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN		8784	5.6	5366	61%
PJM	PENELEC_2_MSA_DuBois_G	7753	PJM	PL_7_MSA_Allentown_L	8784	5.6	7760	88%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_6_MSA_Chicago_G	463	5.6	5133	58%
				AEP_9_MSA_Canton-				
	NI_6_MSA_Chicago_G	8321		Massillon_L	8784		2955	34%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	FRCC	FPL_2_MSA_FortMyers_G	8464	5.6	4382	50%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	463	5.6	4502	51%
				AP_7_MSA_Hagerstown-				
PJM	AP_1_County_Harrison_G	8784	PJM	Martinsburg_L	8784	5.6	7603	87%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPL_2_MSA_FortMyers_G	8464	5.6	4380	50%
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	VAP_33_MSA_DC_L	8784	5.5	7762	88%
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	5.5	7719	88%
NEPOOL	NEPOOL_7_CT	7667	NYPP	NYISO_10_NYJ	8784	5.5	8775	100%
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	VAP_27_MSA_DC_L	8784	5.4	7587	86%
NEPOOL	NEPOOL_3_ME	3752	NEPOOL	NEPOOL_9_NWKST	8784	5.4	8767	100%
				AEP_9_MSA_Canton-				
PJM	NI_20_MSA_Chicago_G	7234	PJM	Massillon_L	8784	5.4	2963	34%
ENTERGY	EES_9_MSA_Russellville_G	2477	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	5.3	5901	67%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_3_MSA_Pittsburgh_G	8758	PJM	Martinsburg_L	8784	5.3	7617	87%
	EES_8_MSA_BatonRouge_G			EES_5_MSA_NewOrleans_G	8784		5064	58%
NYPP	NYISO_8_NYH	8784	NEPOOL	NEPOOL_7_CT	1117	5.3	8753	100%
	LAGN_1_MSA_BatonRouge_G			EES_5_MSA_NewOrleans_G	8784		6329	72%
	PJM500_9_MSA_Pittsburgh_G		PJM	VAP_33_MSA_DC_L	8784		7786	89%
	NEPOOL_5_SEMA			NYISO_10_NYJ	8784		8774	100%
	SOCO_15_MSA_Birmingham_G			FPC_4_MSA_Tampa_L	8784		4124	47%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPL_2_MSA_FortMyers_G	8464	5.1	4535	52%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	PJM500_9_MSA_Pittsburgh_G	8784	PJM	VAP_27_MSA_DC_L	8784	5.1	7545	86%
	EES_9_MSA_Russellville_G			SOCO_17_MSA_Mobile_G	7680		3393	39%
	SOCO_28_MSA_Birmingham_G			FPC_4_MSA_Tampa_L	8784		4125	47%
	NYISO_6_NYF			NYISO_9_NYI	8467		8643	98%
	NYISO_3_NYC			NYISO_7_NYG	8420		5594	64%
MISO	CIN_3_MSA_TerreHaute_G		MISO	LGEE_5_MSA_Lexington_L	8784		255	3%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	FRCC	FPL_2_MSA_FortMyers_G	8464	5.0	4375	50%
				AP_7_MSA_Hagerstown-				
	PJM500_9_MSA_Pittsburgh_G	8784		Martinsburg_L	8784	5.0	7607	87%
PJM	PJM500_7_MSA_York-Hanover_	8784		VAP_7_G	1371	4.9	6054	69%
				AEPW_9_MSA_MountPleasan				
ENTERGY	EES_9_MSA_Russellville_G	2477	SPP	t_G	1800	4.9	2759	31%
VACAR	CPLE_1_MSA_Durham_G	7555	PJM	VAP_33_MSA_DC_L	8784	4.8	7593	86%
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_6_MSA_Chicago_G	463	4.8	6187	70%
PJM	PJM500_5_MSA_DC_G	8784	PJM	VAP_7_G	1371	4.8	4880	56%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_3_MSA_Chicago_L	8784	4.8	5105	58%
PJM	NI_7_MSA_Rochelle_G	8784	PJM	NI_13_MSA_Chicago_L	8784	4.8	5083	58%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_3_MSA_Chicago_L	8784	4.8	4503	51%
MISO	WEC_1_MSA_Chicago_G	8784	PJM	NI_13_MSA_Chicago_L	8784	4.7	4502	51%
	CPLE_1_MSA_Durham_G	7555	PJM	VAP_27_MSA_DC_L	8784	4.7	7300	83%
NYPP	NYISO_3_NYC	8784	NEPOOL	NEPOOL_9_NWKST	8784	4.7	8769	100%
PJM	PJM500_4_MSA_Philadelphia_G	8496	PJM	VAP_7_G	1371	4.7	5560	63%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	FRCC	FPC_4_MSA_Tampa_L	8784	4.7	4283	49%
MISO	LGEE_3_GEN_Gehnt2_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	4.7	6092	69%
	EES_10_MSA_Vicksburg_G			EES_5_MSA_NewOrleans_G	8784		6335	72%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110		FPC_3_MSA_Orlando_L	8784	4.6	4143	47%
				SOCO_10_MSA_Albany-				
	TVA_1_MSA_Chatt-Hunts_G		SOUTHERN	_	7678		536	6%
	SOCO_31_MSA_Atlanta_G			FPC_4_MSA_Tampa_L	8784	_	4123	47%
	EKPC_8_MSA_Maysville_G		MISO	LGEE_5_MSA_Lexington_L	8784		1034	12%
PJM	AEP_8_GEN_Amos01_G	8784	VACAR	DUK_4_MSA_Greenville_L	6956	4.5	5242	60%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Congestion Indicators		
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %	
				EES_7_MSA_Beaumont-					
ENTERGY	EES_9_MSA_Russellville_G	2477		PortArthur_G	6142	4.5	6314	72%	
PJM	AEP_8_GEN_Amos01_G	8784	MISO	LGEE_5_MSA_Lexington_L	8784	4.4	83	1%	
NEPOOL	NEPOOL_3_ME	3752	NEPOOL	NEPOOL_6_WCMA	8707	4.4	6948	79%	
NYPP	NYISO_3_NYC	8784	PJM	PSEG_8_MSA_NewYork_G	8779	4.4	7548	86%	
NYPP	NYISO_1_NYA	8323	NEPOOL	NEPOOL_3_ME	5032	4.4	6484	74%	
				SOCO_10_MSA_Albany-					
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	Valdosta_L	7678	4.3	1789	20%	
	NEPOOL_3_ME	3752	NEPOOL	NEPOOL_4_NEBOS	8631	4.3	6823	78%	
NYPP	NYISO_3_NYC	8784	PJM	PSEG_3_MSA_NewYork_L	8784	4.3	7199	82%	
PJM	VAP_7_G	7413	PJM	AP_8_MSA_DC-VA-MD_L	8784	4.3	5956	68%	
NEPOOL	NEPOOL_7_CT	7667	NYPP	NYISO_9_NYI	8467	4.3	8615	98%	
ENTERGY	EES_9_MSA_Russellville_G	2477	ENTERGY	EES_1_MSA_Jackson_L	8784	4.2	2320	26%	
ENTERGY	EES_9_MSA_Russellville_G	2477	TVAUTHOR	TVA_7_MSA_Memphis_L	8725	4.2	1050	12%	
MISO	NIPS_8_MSA_Chicago_G	8760	MISO	CIN_7_MSA_Lafayette_L	8784	4.2	1662	19%	
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	4.1	4764	54%	
VACAR	DUK_4_MSA_Greenville_L	1828	VACAR	SCPSA_2_MSA_Charleston_L	8784	4.1	2603	30%	
ENTERGY	EES_9_MSA_Russellville_G	2477	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	4.1	3407	39%	
PJM	PJM500_7_MSA_York-Hanover_	8784	PJM	PECO_5_MSA_Philadelphia_L	6985	4.0	2626	30%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	FRCC	FPC_3_MSA_Orlando_L	8784	4.0	3426	39%	
	DLCO_7_MSA_Pittsburgh_G	8616	MISO	FE_5_MSA_Cleveland_L	6639	4.0	4675	53%	
PJM	VAP_7_G	7413	PJM	VAP_33_MSA_DC_L	8784	4.0	5947	68%	
MISO	ITC_7_MSA_Monroe_G	8712	MISO	FE_5_MSA_Cleveland_L	6639	4.0	6366	72%	
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_3_MSA_Chicago_L	8784	4.0	6159	70%	
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_9_NYI	8467	4.0	8635	98%	
PJM	NI_15_MSA_Davenport_G	8670	MISO	WEC_3_MSA_Milwaukee_G	7208	4.0	4858	55%	
MISO	ALTE_2_MSA_Madison_G	8616	PJM	NI_13_MSA_Chicago_L	8784	4.0	6158	70%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	FRCC	FPC_3_MSA_Orlando_L	8784	4.0	3428	39%	
MISO	FE_6_MSA_Pittsburgh_G	8784	MISO	FE_5_MSA_Cleveland_L	6639	3.9	4613	53%	
	FE_9_MSA_Weirton_G	8628	MISO	FE_5_MSA_Cleveland_L	6639	3.9	4056	46%	
MISO	LGEE_3_GEN_Gehnt2_G	8784		AEP_2_STA_TN-WV_L	8784	3.9	4978	57%	
PJM	VAP 7 G	7413		VAP_27_MSA_DC_L	8784		5951	68%	

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
	NYISO_3_NYC	8784	PJM	PSEG_5_MSA_Philadelphia_L	8784		7605	87%	
PJM	AEP_8_GEN_Amos01_G	8784	VACAR	DUK_8_MSA_Charlotte_L	8784	3.8	3528	40%	
PJM	PJM500_4_MSA_Philadelphia_G	8496	PJM	PECO_5_MSA_Philadelphia_L	6985	3.8	1	0%	
MISO	ITC_3_MSA_Detroit_G	8784	MISO	FE_5_MSA_Cleveland_L	6639	3.8	8361	95%	
				AP_7_MSA_Hagerstown-					
PJM	VAP_7_G	7413		Martinsburg_L	8784	3.8	5860	67%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	3.7	5924	67%	
NYPP	NYISO_3_NYC			NEPOOL_6_WCMA	8707	3.7	8390	96%	
ONTARIO	IESO_6_G	8784	NYPP	NYISO_6_NYF	1006	3.7	6319	72%	
	IESO 7 G	8784	NYPP	NYISO_6_NYF	1006	3.7	6319	72%	
	IESO 15 G	8396	NYPP	NYISO 6 NYF	1006	3.7	6315	72%	
PJM	AP 1 County Harrison G	8784	PJM	VAP 15 MSA VB-Norfolk L	8784	3.7	7574	86%	
	BREC_3_County_Webster_G	8784	MISO	LGEE_9_MSA_Louisville_G	8784	3.6	7458	85%	
	NEPOOL 3 ME	3752		NEPOOL 10 RI	6243	3.6	6823	78%	
	TVA_1_MSA_Chatt-Hunts_G	8781	MISO	LGEE_5_MSA_Lexington_L	8784	3.6	1623	18%	
	NYISO 3 NYC	8784		NEPOOL 4 NEBOS	8631	3.6	8764	100%	
				SOCO_10_MSA_Albany-					
VACAR	DUK_4_MSA_Greenville_L	1828	SOUTHERN		7678	3.6	498	6%	
MISO	LGEE 3 GEN Gehnt2 G			TVA 7 MSA Memphis L	8725		5676	65%	
	SOCO_26_MSA_Macon_G			FPC_3_MSA_Orlando_L	8784		3607	41%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	VACAR	SCPSA_2_MSA_Charleston_L	8784	3.5	4042	46%	
							7		
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	SOUTHERN	SOCO_17_MSA_Mobile_G	7680	3.5	5534	63%	
SPP	CELE_10_MSA_Alexandria_G	8586	ENTERGY	EES_5_MSA_NewOrleans_G	8784	3.5	6488	74%	
PJM	PJM500_3_MSA_Pittsburgh_G	8758		VAP 15 MSA VB-Norfolk L	8784	3.4	7590	86%	
MISO	LGEE_3_GEN_Gehnt2_G			TVA_3_MSA_Knoxville_L	8784		5624	64%	
	SOCO_31_MSA_Atlanta_G			FPC_3_MSA_Orlando_L	8784		3424	39%	
	AMRN_12_MSA_StLouis_L			AMRN_2_County_Macon_L	8784		4425	50%	
	NYISO 8 NYH			NYISO 11 NYK	8784		8784	100%	
	NEPOOL_2_NH			NYISO_7_NYG	8420		6881	78%	

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				AEPW_9_MSA_MountPleasan				
SPP	AEPW_5_MSA_Tulsa_G	7062	SPP	t_G	1800	3.3	3516	40%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	AEP_1_MSA_Lynchburg_G	8784	3.3	5982	68%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_1_MSA_Lynchburg_G	8784	3.3	4149	47%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8784	ENTERGY	EES_9_MSA_Russellville_G	6307	3.3	4478	51%
PJM	AEP_8_GEN_Amos01_G	8784	MISO	FE_5_MSA_Cleveland_L	6639	3.2	4962	56%
	SOCO_32_MSA_Pascagoula_G			EES_5_MSA_NewOrleans_G	8784		6629	75%
	SEC_6_MSA_Palatka_G			FPL_7_MSA_Miami_L	8784		4733	54%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	PJM	AP_2_GEN_Albright3_L	8784	3.1	4812	55%
	BGE_7_MSA_Baltimore-Towson	7066		PECO_5_MSA_Philadelphia_L	6985		3818	43%
	PJM500_9_MSA_Pittsburgh_G	8784		VAP_15_MSA_VB-Norfolk_L	8784		7539	86%
	SEC_6_MSA_Palatka_G	8160		FPL_3_MSA_Miami_L	8783	3.1	4751	54%
	FE_6_MSA_Pittsburgh_G	8784	PJM	AP_2_GEN_Albright3_L	8784	3.0	4809	55%
MISO	FE_9_MSA_Weirton_G	8628	PJM	AP_2_GEN_Albright3_L	8784	3.0	4803	55%
NEPOOL	NEPOOL_2_NH	8501	NEPOOL	NEPOOL_9_NWKST	8784	3.0	8779	100%
	SOCO_15_MSA_Birmingham_G			SCPSA_2_MSA_Charleston_L	8784		2417	28%
	TVA_4_MSA_Clarksville_G	8616		AEP_2_STA_TN-WV_L	8784	3.0	5189	59%
MISO	IPL_2_MSA_Jasper_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	3.0	4341	49%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	SOUTHERN	Valdosta_L	7678	3.0	1758	20%
	SOCO_28_MSA_Birmingham_G			SCPSA_2_MSA_Charleston_L	8784		2457	28%
NYPP	NYISO_3_NYC	8784		NEPOOL_10_RI	6243	2.9	8764	100%
				EES_7_MSA_Beaumont-				
SPP	AEPW_5_MSA_Tulsa_G	7062	ENTERGY	PortArthur_G	6142	2.9	6069	69%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_5_GEN_GEPCHY_L	8784		652	7%
SPP	AEPW_5_MSA_Tulsa_G	7062	ENTERGY	EES_9_MSA_Russellville_G	6307	2.9	5952	68%
				EES_7_MSA_Beaumont-				
SPP	AEPW_9_MSA_MountPleasant_	6984		PortArthur_G	6142		8737	99%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	ENTERGY	EES_9_MSA_Russellville_G	6307	2.9	5492	63%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name		Market Area		Hours	Differential	Hours	U90 %
SPP	AEPW_9_MSA_MountPleasant_	6984	ENTERGY	EES_9_MSA_Russellville_G	6307	2.9	8747	100%
	TVA_1_MSA_Chatt-Hunts_G	8781	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	2.8	793	9%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_7_MSA_Miami_L	8784	2.8	5038	57%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8781	SOUTHERN	SOCO_33_MSA_Atlanta_L	8784	2.8	754	9%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_16_MSA_Atlanta_L	8784		259	3%
	FPC_2_MSA_HomosassaSpring			FPL_3_MSA_Miami_L	8783		5048	57%
	NI_7_MSA_Rochelle_G			WEC_3_MSA_Milwaukee_G	7208		5230	60%
	WEC_1_MSA_Chicago_G			WEC_3_MSA_Milwaukee_G	7208		147	2%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_21_MSA_Atlanta_G	8776		145	2%
	NIPS_8_MSA_Chicago_G	8760		NI_6_MSA_Chicago_G	463		6	0%
VACAR	CPLE_1_MSA_Durham_G	7555	PJM	VAP_15_MSA_VB-Norfolk_L	8784	2.7	6298	72%
	EES_10_MSA_Vicksburg_G		SOUTHERN		8784		1944	22%
SPP	AEPW_5_MSA_Tulsa_G	7062	ENTERGY	EES_1_MSA_Jackson_L	8784	2.7	5184	59%
	SOCO_15_MSA_Birmingham_G			EES_5_MSA_NewOrleans_G	8784		6871	78%
MISO	AMRN_12_MSA_StLouis_L	6702	PJM	NI_6_MSA_Chicago_G	463	2.7	5902	67%
				SOCO_6_MSA_Augusta-				
	TVA_1_MSA_Chatt-Hunts_G		SOUTHERN		8784		349	4%
FRCC	JEA_6_MSA_Jacksonville_G			FPL_7_MSA_Miami_L	8784		4045	46%
	AEPW_9_MSA_MountPleasant_			EES_1_MSA_Jackson_L	8784		8745	100%
	TVA_4_MSA_Clarksville_G			TVA_7_MSA_Memphis_L	8725		5089	58%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_3_MSA_Miami_L	8783	2.6	4067	46%
	EES_10_MSA_Vicksburg_G		SOUTHERN		8784		2040	23%
NYPP	NYISO_6_NYF	7778	NYPP	NYISO_7_NYG	8420	2.6	4735	54%
SPP	WERE_1_MSA_Manhattan_G	8739	SPP	KACP_7_MSA_KansasCity_L	8784	2.6	3172	36%
	EES_10_MSA_Vicksburg_G			SOCO_33_MSA_Atlanta_L	8784		2028	23%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	ENTERGY	EES_5_MSA_NewOrleans_G	8784	2.6	6837	78%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
	EES_10_MSA_Vicksburg_G			SOCO_16_MSA_Atlanta_L	8784		1698	19%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	2.5	5565	63%
	SOCO_26_MSA_Macon_G			SCPSA_2_MSA_Charleston_L	8784		1459	17%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	2.5	5137	58%
ENTED OV		2000	0011711551		0770	0.5	4545	4.007
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776	2.5	1545	18%
ENTEROY	FFC 40 MCA Violenteres C	0000	COLITUEDAL	SOCO_6_MSA_Augusta-	0704	0.4	4 404	470/
ENTERGY	EES_10_MSA_Vicksburg_G	8088	SOUTHERN	_	8784	2.4	1491	17%
COLITHERN	SOCO 45 MSA Directional company	0605	COLITHEDA	SOCO_10_MSA_Albany-	7670	2.4	500	CO/
SOUTHERN	SOCO_15_MSA_Birmingham_G	0090	SOUTHERN	vaidosta_L	7678	2.4	536	6%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	VACAR	SCEG 9 MSA Charleston G	8611	2.4	3439	39%
COOTTILITATE	document_i docugodid_c	0110	77107111	COLO_O_MO/ (_C/MANOCION_C	0011	2. 1	0-100	0070
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	VACAR	SCPSA_2_MSA_Charleston_L	8784	2.4	2615	30%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	SOUTHERN	Valdosta_L	7678	2.3	544	6%
ENTERGY	EES_4_GEN_Ouachita_G	5357	ENTERGY	EES_5_MSA_NewOrleans_G	8784	2.3	6332	72%
	AEP_8_GEN_Amos01_G	8784	PJM	AP_2_GEN_Albright3_L	8784	2.3	6110	70%
	NYISO_8_NYH	8784	NYPP	NYISO_10_NYJ	8784		8783	100%
NYPP	NYISO_6_NYF	7778	NEPOOL	NEPOOL_9_NWKST	8784	2.3	8767	100%
SOUTHERN	SOCO_26_MSA_Macon_G	8784		EES_5_MSA_NewOrleans_G	8784	2.2	6959	79%
				AEP_9_MSA_Canton-				
TVAUTHOR	TVA_4_MSA_Clarksville_G	8616	PJM	Massillon_L	8784	2.2	5321	61%
				AEP_9_MSA_Canton-				
MISO	IPL_2_MSA_Jasper_G	8784	PJM	Massillon_L	8784	2.2	2600	30%
				SOCO_10_MSA_Albany-				
	EES_4_GEN_Ouachita_G		SOUTHERN		7678		1893	22%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	VACAR	DUK_4_MSA_Greenville_L	6956	2.1	3343	38%
			-					
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	ENTERGY	EES_5_MSA_NewOrleans_G	8784	2.0	6886	78%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
				METC_4_MSA_Holland-				
MISO	WEC_1_MSA_Chicago_G	8784	MISO	GrandHaven_G	2565	2.0	5769	66%
PJM	VAP_1_MSA_Richmond_G	8784	PJM	AP_8_MSA_DC-VA-MD_L	8784	2.0	4191	48%
NEPOOL	NEPOOL_2_NH	8501	NEPOOL	NEPOOL_6_WCMA	8707	2.0	6955	79%
MISO	ALTE_2_MSA_Madison_G	8616	MISO	WEC_3_MSA_Milwaukee_G	7208	2.0	2479	28%
VACAR	DUK_4_MSA_Greenville_L	1828	VACAR	DUK_8_MSA_Charlotte_L	8784	2.0	0	0%
NYPP	NYISO_6_NYF	7778	PJM	PSEG_8_MSA_NewYork_G	8779	2.0	7735	88%
COLITHEDN	2000 00 M2A Massa C	0704	COLITHEDN	SOCO_10_MSA_Albany-	7678	1.0	675	00/
SOUTHERN	SOCO_26_MSA_Macon_G	8784	SOUTHERN	valdosta_L	/6/8	1.9	6/5	8%
VACAR	DUK_4_MSA_Greenville_L	1828	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8784	1.9	35	0%
ONTARIO	IESO_6_G	8784	NYPP	NYISO_2_NYB	8784	1.9	8313	95%
ONTARIO	IESO_7_G	8784	NYPP	NYISO_2_NYB	8784	1.9	8429	96%
NEPOOL	NEPOOL_2_NH	8501	NEPOOL	NEPOOL_4_NEBOS	8631	1.9	6823	78%
SOLITHERN	SOCO_15_MSA_Birmingham_G	8695	VACAR	SCEG_9_MSA_Charleston_G	8611	1.9	2548	29%
	IESO 15 G			NYISO 2 NYB	8784		8294	94%
	NYISO 6 NYF	7778		PSEG 3 MSA NewYork L	8784		7732	88%
	NIPS_8_MSA_Chicago_G	8760		NI_3_MSA_Chicago_L	8784		6	0%
PJM	VAP 7 G	7413		VAP 15 MSA VB-Norfolk L	8784		5970	68%
MISO	FE_6_MSA_Pittsburgh_G	8784			8784		6538	74%
	FE_9_MSA_Weirton_G	8628		AEP_1_MSA_Lynchburg_G	8784		6422	73%
	DUK 4 MSA Greenville L			SOCO 8 MSA Atlanta L	8784		252	3%
	NIPS_8_MSA_Chicago_G	8760		NI_13_MSA_Chicago_L	8784		206	2%
	SEC 6 MSA Palatka G			FPL 2 MSA FortMyers G	8464		3796	43%
	DUK_4_MSA_Greenville_L	1828		SOCO_33_MSA_Atlanta_L	8784	1.8	182	2%
	NEPOOL 7 CT			NYISO_7_NYG	8420	1.8	5793	66%
	AMRN_12_MSA_StLouis_L	6702		NI_3_MSA_Chicago_L	8784		5767	66%
		2010			0044	4.0		000/
	SOCO_28_MSA_Birmingham_G			SCEG_9_MSA_Charleston_G	8611		2553	29%
PJM	NI_2_MSA_Chicago_G	8784	MISO	AMRN_2_County_Macon_L	8784	1.8	4908	56%
VACAR	DUK_4_MSA_Greenville_L	1828	SOUTHERN	SOCO_16_MSA_Atlanta_L	8784	1.8	253	3%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %	
				SOCO_10_MSA_Albany-					
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	SOUTHERN	Valdosta_L	7678	1.8	480	5%	
MISO	AMRN_12_MSA_StLouis_L	6702	PJM	NI_13_MSA_Chicago_L	8784	1.8	5890	67%	
MISO	CIN_3_MSA_TerreHaute_G	6968	PJM	AEP_1_MSA_Lynchburg_G	8784	1.7	3302	38%	
PJM	VAP_1_MSA_Richmond_G	8784	PJM	VAP_33_MSA_DC_L	8784	1.7	4626	53%	
VACAR	DUK_4_MSA_Greenville_L	1828	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776	1.7	103	1%	
FRCC	FPL_8_MSA_PortStLucie_G	8751	FRCC	FPL_7_MSA_Miami_L	8784	1.7	3103	35%	
VACAR	DUK_9_MSA_Charlotte_G	8783	SOUTHERN	SOCO_10_MSA_Albany-Valdo	7678	1.7	538	6%	
FRCC	FPL_8_MSA_PortStLucie_G	8751	FRCC	FPL_3_MSA_Miami_L	8783	1.7	2469	28%	
	DUK_4_MSA_Greenville_L	1828	SOUTHERN	SOCO_6_MSA_Augusta-Richm	8784	1.6	349	4%	
MISO	EKPC_8_MSA_Maysville_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	1.6	5380	61%	
ENTERGY	EES_2_MSA_Batesville_G	8784	ENTERGY	EES_9_MSA_Russellville_G	6307	1.6	2090	24%	
PJM	VAP_1_MSA_Richmond_G	8784	PJM	VAP_27_MSA_DC_L	8784	1.6	3453	39%	
PJM	AEP_8_GEN_Amos01_G	8784	TVAUTHOR	TVA_5_MSA_Nashville_L	8567	1.6	5813	66%	
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPL_2_MSA_FortMyers_G	8464	1.5	4827	55%	
ENTERGY	EES_7_MSA_Beaumont-PortArtl	2642	ENTERGY	EES_5_MSA_NewOrleans_G	8784	1.5	6328	72%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8695	VACAR	DUK_4_MSA_Greenville_L	6956	1.5	2501	28%	
	-			AP_7_MSA_Hagerstown-					
PJM	VAP_1_MSA_Richmond_G	8784	PJM	Martinsburg_L	8784	1.5	4933	56%	
MISO	LGEE_3_GEN_Gehnt2_G	8784	MISO	CIN_1_MSA_Indianapolis_L	8784	1.5	4943	56%	
NEPOOL	NEPOOL_5_SEMA	8784	NYPP	NYISO_7_NYG	8420	1.5	5835	66%	
MISO	FE_6_MSA_Pittsburgh_G	8784	PJM	AEP_2_STA_TN-WV_L	8784	1.5	5313	60%	
MISO	FE_9_MSA_Weirton_G	8628	PJM	AEP_2_STA_TN-WV_L	8784	1.5	5114	58%	
NEPOOL	NEPOOL_7_CT	7667	NEPOOL	NEPOOL_9_NWKST	8784	1.5	8753	100%	
FRCC	FPC_10_MSA_Lakeland_G	8093	FRCC	FPL_7_MSA_Miami_L	8784	1.5	4378	50%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8616	VACAR	DUK_4_MSA_Greenville_L	6956	1.5	2469	28%	
SPP	WERE_1_MSA_Manhattan_G	8739	SPP	AEPW_1_MSA_Tulsa_G	7156	1.4	8679	99%	
FRCC	FPC_10_MSA_Lakeland_G	8093	FRCC	FPL_3_MSA_Miami_L	8783	1.4	4383	50%	
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_7_MSA_Memphis_L	8725	1.4	3147	36%	
SOUTHERN	SOCO_26_MSA_Macon_G	8784		SCEG_9_MSA_Charleston_G	8611		2536	29%	
PJM	NI_6_MSA_Chicago_G	8321	MISO	AMRN_2_County_Macon_L	8784	1.4	4866	55%	

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_6_NYF	7778	PJM	PSEG_5_MSA_Philadelphia_L	8784	1.4	7985	91%
MISO	CIN_3_MSA_TerreHaute_G	6968	PJM	AEP_2_STA_TN-WV_L	8784	1.4	3626	41%
	SOCO_32_MSA_Pascagoula_G			DUK_8_MSA_Charlotte_L	8784	1.4	3436	39%
FRCC	SEC_6_MSA_Palatka_G			FPC_4_MSA_Tampa_L	8784	1.4	3500	40%
FRCC	JEA_6_MSA_Jacksonville_G	8784	FRCC	FPL_2_MSA_FortMyers_G	8464	1.4	3781	43%
VACAR	SCPSA_10_MSA_Charleston_G	8616	VACAR	SCPSA_2_MSA_Charleston_L	8784	1.3	1545	18%
	SOCO_32_MSA_Pascagoula_G			SOCO_5_GEN_GEPCHY_L	8784	1.3	1914	22%
	NYISO_6_NYF			NEPOOL_6_WCMA	8707	1.3	7472	85%
	DPL_8_GEN_Killen_G	8759		AEP_1_MSA_Lynchburg_G	8784	1.3	3219	37%
	EES_7_MSA_Beaumont-PortArth			SOCO_10_MSA_Albany-Valdo	7678	1.3	3667	42%
	FPC_2_MSA_HomosassaSpring			TECO_7_MSA_Tampa_L	8784	1.3	3198	36%
NYPP	NYISO_1_NYA	8323	NYPP	NYISO_6_NYF	1006	1.3	6167	70%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8772	VACAR	SCEG_9_MSA_Charleston_G	8611	1.3	2679	30%
ENTERGY	EES_2_MSA_Batesville_G	8784	TVAUTHOR	TVA_3_MSA_Knoxville_L	8784	1.2	3711	42%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	SOUTHERN	SOCO_8_MSA_Atlanta_L	8784	1.2	2002	23%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110		SOCO_33_MSA_Atlanta_L	8784	1.2	1961	22%
	NI_15_MSA_Davenport_G	8670	MISO	WEC_7_MSA_Milwaukee_G	7702	1.2	5487	62%
PJM	DLCO_7_MSA_Pittsburgh_G	8616	MISO	FE_4_MSA_Akron_L	8784	1.2	1333	15%
	SOCO_32_MSA_Pascagoula_G			SOCO_16_MSA_Atlanta_L	8784		1643	19%
	NEPOOL_2_NH			NEPOOL_10_RI	6243		6823	78%
	ITC_7_MSA_Monroe_G			FE_4_MSA_Akron_L	8784	1.2	4706	54%
	NEPOOL_5_SEMA			NEPOOL_9_NWKST	8784	1.2	8754	100%
PJM	AEP_8_GEN_Amos01_G	8784		AEP_1_MSA_Lynchburg_G	8784	1.2	3212	37%
NYPP	NYISO_6_NYF			NEPOOL_4_NEBOS	8631	1.1	7494	85%
	NI_20_MSA_Chicago_G		MISO	AMRN_2_County_Macon_L	8784	1.1	4804	55%
MISO	FE_6_MSA_Pittsburgh_G			FE_4_MSA_Akron_L	8784	1.1	1289	15%
MISO	FE_9_MSA_Weirton_G	8628	MISO	FE_4_MSA_Akron_L	8784	1.1	3864	44%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2008R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion Indicators		
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	SOUTHERN	SOCO_21_MSA_Atlanta_G	8776	1.1	1500	17%
PJM	NI_2_MSA_Chicago_G	8784	PJM	NI_6_MSA_Chicago_G	463	1.1	0	0%
NYPP	NYISO_8_NYH	8784	NYPP	NYISO_9_NYI	8467	1.1	6780	77%
FRCC	FPC_2_MSA_HomosassaSpring	8784	FRCC	FPC_4_MSA_Tampa_L	8784	1.1	2416	28%
SOUTHERN	SOCO_26_MSA_Macon_G	8784	VACAR	DUK_4_MSA_Greenville_L	6956	1.0	1291	15%
				SOCO_6_MSA_Augusta-				
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8110	SOUTHERN	Richmond_L	8784	1.0	1464	17%
MISO	LGEE_3_GEN_Gehnt2_G	8784	MISO	LGEE_9_MSA_Louisville_G	8784	1.0	4975	57%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
PJM	NI_2_MSA_Chicago_G	8760		AEP_1_MSA_Lynchburg_G	8760		4427	50%
PJM	NI_6_MSA_Chicago_G	7665		AEP_1_MSA_Lynchburg_G	8760		4450	51%
PJM	NI_7_MSA_Rochelle_G	8760		AEP_1_MSA_Lynchburg_G	8760		5550	63%
PJM	NI_15_MSA_Davenport_G	8712	PJM	AEP_1_MSA_Lynchburg_G	8760	10.1	5076	58%
PJM	NI_20_MSA_Chicago_G	7874	PJM	AEP_1_MSA_Lynchburg_G	8760	3.8	4319	49%
MISO	NIPS_8_MSA_Chicago_G	8658		AEP_1_MSA_Lynchburg_G	8760		4169	47%
MISO	IPL_2_MSA_Jasper_G	8760		AEP_1_MSA_Lynchburg_G	8760	3.2	6959	79%
MISO	AMRN_12_MSA_StLouis_L	6277	PJM	AEP_1_MSA_Lynchburg_G	8760	9.9	7273	83%
PJM	NI_20_MSA_Chicago_G	7874	PJM	AEP_2_STA_TN-WV_L	8760	3.8	1264	14%
PJM	NI_2_MSA_Chicago_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	3.7	1358	15%
PJM	NI_6_MSA_Chicago_G	7665	PJM	AEP_2_STA_TN-WV_L	8760	3.2	1370	16%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	7.5	3718	42%
PJM	NI_15_MSA_Davenport_G	8712	PJM	AEP_2_STA_TN-WV_L	8760	10.1	3128	36%
MISO	NIPS_8_MSA_Chicago_G	8658	PJM	AEP_2_STA_TN-WV_L	8760	3.9	1054	12%
MISO	LGEE_3_GEN_Gehnt2_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	3.7	5035	57%
MISO	IPL_2_MSA_Jasper_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	3.2	6276	71%
MISO	AMRN_12_MSA_StLouis_L	6277	PJM	AEP_2_STA_TN-WV_L	8760	10.0	6397	73%
				AEP_9_MSA_Canton-				
MISO	NIPS_8_MSA_Chicago_G	8658		Massillon_L	8760	4.4	1096	12%
				AEP_9_MSA_Canton-				
PJM	NI_20_MSA_Chicago_G	7874		Massillon_L	8760	4.3	1689	19%
				AEP_9_MSA_Canton-				
PJM	NI_15_MSA_Davenport_G	8712		Massillon_L	8760	10.6	3668	42%
				AEP_9_MSA_Canton-				
PJM	NI_7_MSA_Rochelle_G	8760		Massillon_L	8760	7.9	4027	46%
				AEP_9_MSA_Canton-				
PJM	NI_6_MSA_Chicago_G	7665	PJM	Massillon_L	8760	3.6	1696	19%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8760	PJM	Massillon_L	8760	4.1	1689	19%
				AEP_9_MSA_Canton-				
MISO	AMRN_12_MSA_StLouis_L	6277		Massillon_L	8760	10.4	6611	75%
				AEP_9_MSA_Canton-				
MISO	IPL_2_MSA_Jasper_G	8760		Massillon_L	8760		6429	73%
PJM	NI_6_MSA_Chicago_G	7665	MISO	AMRN_12_MSA_StLouis_L	2483	5.0	1447	16%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub In	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area			Market Area		Hours	Differential	Hours	U90 %
MISO	CIN_8_MSA_Evansville_G		MISO	AMRN_12_MSA_StLouis_L	2483	4.9	6246	71%
MISO	IP_7_GEN_Baldwin_G	8760	MISO	AMRN_12_MSA_StLouis_L	2483	9.3	1	0%
MISO	IP_8_GEN_Clinton_G	8002	MISO	AMRN_12_MSA_StLouis_L	2483	6.5	447	5%
MAPP	MEC_3_MSA_DesMoines_G	8427	MISO	AMRN_12_MSA_StLouis_L	2483	19.7	2611	30%
PJM	NI_2_MSA_Chicago_G	8760	MISO	AMRN_12_MSA_StLouis_L	2483	5.4	1432	16%
	TVA_4_MSA_Clarksville_G		MISO	AMRN_12_MSA_StLouis_L	2483		1194	14%
	NI_15_MSA_Davenport_G		MISO	AMRN_12_MSA_StLouis_L	2483	11.9	2907	33%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	AMRN_12_MSA_StLouis_L	2483	1.6	110	1%
	NI_20_MSA_Chicago_G	7874	MISO	AMRN_12_MSA_StLouis_L	2483	5.6	1085	12%
PJM	NI_7_MSA_Rochelle_G	8760	MISO	AMRN_12_MSA_StLouis_L	2483	9.2	3849	44%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	MISO	AMRN_12_MSA_StLouis_L	2483	4.5	2590	29%
MISO	AMRN_12_MSA_StLouis_L	6277	MISO	AMRN_2_County_Macon_L	8760	6.2	4271	49%
PJM	NI_7_MSA_Rochelle_G	8760	MISO	AMRN_2_County_Macon_L	8760	3.7	5041	57%
MAPP	MEC_3_MSA_DesMoines_G	8427	MISO	AMRN_2_County_Macon_L	8760	14.1	4735	54%
MISO	IP_7_GEN_Baldwin_G	8760	MISO	AMRN_2_County_Macon_L	8760	3.8	4635	53%
PJM	NI_15_MSA_Davenport_G	8712	MISO	AMRN_2_County_Macon_L	8760	6.3	4521	51%
MISO	FE_9_MSA_Weirton_G	8760	PJM	AP_2_GEN_Albright3_L	8760	1.9	4667	53%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	AP_2_GEN_Albright3_L	8760	2.2	4653	53%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_2_GEN_Albright3_L	8760	1.8	6100	69%
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AP_2_GEN_Albright3_L	8760	2.0	4518	51%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Martinsburg_L	8760	6.7	7650	87%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	AP_7_MSA_Hagerstown-Martir	8760	1.2	4641	53%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Martinsburg_L	8760	7.0	7651	87%
				AP_7_MSA_Hagerstown-				
MISO	FE_9_MSA_Weirton_G	8760	PJM	Martinsburg_L	8760	11.0	8187	93%
				AP_7_MSA_Hagerstown-				
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	Martinsburg_L	8760	11.2	8182	93%
				AP_7_MSA_Hagerstown-				
PJM	AEP_8_GEN_Amos01_G	8760	PJM	Martinsburg_L	8760	11.0	8299	94%
				AP_7_MSA_Hagerstown-				
PJM	AP_1_County_Harrison_G	8760	PJM	Martinsburg_L	8760	7.2	7598	86%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				AP_7_MSA_Hagerstown-				
PJM	VAP_7_G	6808	PJM	Martinsburg_L	8760	2.8	5267	60%
				AP_7_MSA_Hagerstown-				
PJM	DLCO_7_MSA_Pittsburgh_G	8232		Martinsburg_L	8760	11.3	8186	93%
MISO	FE_9_MSA_Weirton_G	8760		AP_8_MSA_DC-VA-MD_L	8760	11.5	8233	94%
PJM	VAP_7_G	6808		AP_8_MSA_DC-VA-MD_L	8760	3.2	5528	63%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	1.6	3942	45%
PJM	PJM500_9_MSA_Pittsburgh_G	8664		AP_8_MSA_DC-VA-MD_L	8760		7744	88%
PJM	AP_1_County_Harrison_G	8760		AP_8_MSA_DC-VA-MD_L	8760		7687	88%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		AP_8_MSA_DC-VA-MD_L	8760		7730	88%
PJM	AEP_8_GEN_Amos01_G	8760		AP_8_MSA_DC-VA-MD_L	8760	11.4	8079	92%
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AP_8_MSA_DC-VA-MD_L	8760	11.6	8220	94%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	AP_8_MSA_DC-VA-MD_L	8760	11.8	8230	94%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664		Towson_L	8760	7.9	7722	88%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	8.2	7761	88%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664		<del>-</del>	8760	7.8	7723	88%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760		Towson_L	8760	8.1	7763	88%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664		Towson_L	8760	8.2	7742	88%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	8.5	7770	88%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.3	2867	33%
MISO	LGEE_3_GEN_Gehnt2_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.8	4938	56%
MISO	CIN_8_MSA_Evansville_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.2	2960	34%
MISO	NIPS_8_MSA_Chicago_G	8658	MISO	CIN_1_MSA_Indianapolis_L	8760	2.0	691	8%
MISO	AMRN_12_MSA_StLouis_L		MISO	CIN_1_MSA_Indianapolis_L	8760	8.0	3753	43%
MISO	NIPS_8_MSA_Chicago_G	8658	MISO	CIN_7_MSA_Lafayette_L	8760	1.1	634	7%
VACAR	DUK_9_MSA_Charlotte_G	8544	VACAR	CPLE_1_MSA_Durham_G	1153	6.6	622	7%
PJM	VAP_7_G	6808	VACAR	CPLE_1_MSA_Durham_G	1153	1.3	5106	58%
VACAR	SCEG_1_MSA_Columbia_G	8179	VACAR	CPLE_1_MSA_Durham_G	1153	4.9	2366	27%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
VACAR	DUK_5_MSA_Seneca_G	6597	VACAR	CPLE_1_MSA_Durham_G	1153	2.1	4662	53%
VACAR	SCPSA_10_MSA_Charleston_G	8760	VACAR	CPLE_1_MSA_Durham_G	1153	5.4	1701	19%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	CPLE_1_MSA_Durham_G	1153	9.5	6794	77%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_4_MSA_Greenville_L	7310	3.7	4415	50%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_8_MSA_Charlotte_L	8760	3.5	3790	43%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	DUK_9_MSA_Charlotte_G	216	22.3	2647	30%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	VACAR	DUK_9_MSA_Charlotte_G	216	22.4	2587	29%
VACAR	SCEG_1_MSA_Columbia_G	8179	VACAR	DUK_9_MSA_Charlotte_G	216	21.0	249	3%
VACAR	DUK_5_MSA_Seneca_G	6597	VACAR	DUK_9_MSA_Charlotte_G	216	18.2	27	0%
VACAR	CPLE_1_MSA_Durham_G	7607	VACAR	DUK_9_MSA_Charlotte_G	216	21.2	342	4%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	DUK_9_MSA_Charlotte_G	216	21.9	558	6%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_9_MSA_Charlotte_G	216	25.5	3985	45%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	VACAR	DUK_9_MSA_Charlotte_G	216	21.9	890	10%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	VACAR	DUK_9_MSA_Charlotte_G	216	21.5	2437	28%
SPP	AEPW_5_MSA_Tulsa_G	7078	ENTERGY	EES_1_MSA_Jackson_L	8760	5.6	2899	33%
SPP	AEPW_9_MSA_MountPleasant_	7520	ENTERGY	EES_1_MSA_Jackson_L	8760	1.2	8715	99%
ENTERGY	EES_9_MSA_Russellville_G	2760	ENTERGY	EES_1_MSA_Jackson_L	8760	7.8	2745	31%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	4.2	7018	80%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	4.3	7010	80%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.9	6752	77%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	4.7	6965	79%
ENTERGY	EES_8_MSA_BatonRouge_G	8496	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.0	5394	61%
ENTERGY	EES_4_GEN_Ouachita_G	6486	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.6	6488	74%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	ENTERGY	EES_5_MSA_NewOrleans_G	8760	4.7	6986	80%
ENTERGY	EES_9_MSA_Russellville_G	2760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	14.1	6873	78%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SPP	AEPW_9_MSA_MountPleasant_	7520	ENTERGY	EES_5_MSA_NewOrleans_G	8760	7.5	8714	99%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.0	6486	74%
SPP	AEPW_5_MSA_Tulsa_G	7078	ENTERGY	EES_5_MSA_NewOrleans_G	8760	11.9	6939	79%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_5_MSA_NewOrleans_G	8760	5.4	6529	74%
				EES_7_MSA_Beaumont-				
SPP	AEPW_9_MSA_MountPleasant_	7520	ENTERGY	PortArthur_G	6502	1.9	8715	99%
				EES_7_MSA_Beaumont-				
SPP	AEPW_5_MSA_Tulsa_G	7078	ENTERGY	PortArthur_G	6502	6.3	4247	48%
				EES_7_MSA_Beaumont-				
ENTERGY	EES_9_MSA_Russellville_G	2760	ENTERGY	PortArthur_G	6502	8.5	7219	82%
ENTERGY	EES_2_MSA_Batesville_G	8743	ENTERGY	EES_9_MSA_Russellville_G	6000	3.7	1843	21%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	ENTERGY	EES_9_MSA_Russellville_G	6000	1.9	0	0%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_9_MSA_Russellville_G	6000	1.3	0	0%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	ENTERGY	EES_9_MSA_Russellville_G	6000	6.6	3522	40%
SPP	AEPW_9_MSA_MountPleasant_	7520	ENTERGY	EES_9_MSA_Russellville_G	6000	3.4	8716	99%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	ENTERGY	EES_9_MSA_Russellville_G	6000	3.4	3043	35%
SPP	AEPW_5_MSA_Tulsa_G			EES_9_MSA_Russellville_G	6000	7.8	265	3%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	ENTERGY	EES_9_MSA_Russellville_G	6000	3.1	1658	19%
MISO	FE_9_MSA_Weirton_G	8760	MISO	FE_5_MSA_Cleveland_L	8040	1.3	2229	25%
MISO	FE_6_MSA_Pittsburgh_G	8592	MISO	FE_5_MSA_Cleveland_L	8040	1.4	4061	46%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	FE_5_MSA_Cleveland_L	8040	1.2	4297	49%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	MISO	FE_5_MSA_Cleveland_L	8040	1.6	4200	48%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	FRCC	FPC_3_MSA_Orlando_L	8760	5.2	4736	54%
	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	5.6	4648	53%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	6.0	4644	53%
	SOCO_15_MSA_Birmingham_G	8438	FRCC	FPC_3_MSA_Orlando_L	8760	6.0	4646	53%
	SOCO_26_MSA_Macon_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	5.5	4639	53%
	SOCO_32_MSA_Pascagoula_G		FRCC	FPC_4_MSA_Tampa_L	8760		5076	58%
	SOCO_26_MSA_Macon_G		FRCC	FPC_4_MSA_Tampa_L	8760		5017	57%
	SOCO 31 MSA Atlanta G		FRCC	FPC_4_MSA_Tampa_L	8760		5020	57%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	FRCC	FPC_4_MSA_Tampa_L	8760	6.6	5020	57%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	6.6	5020	57%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8701	6.8	5335	61%	
	FPC_2_MSA_HomosassaSpring			FPL_2_MSA_FortMyers_G	8701	1.5	5142	59%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	FRCC	FPL_2_MSA_FortMyers_G	8701	6.5	5400	61%	
	SOCO_31_MSA_Atlanta_G			FPL_2_MSA_FortMyers_G	8701	6.9	5338	61%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	FRCC	FPL_2_MSA_FortMyers_G	8701	7.3	5344	61%	
SOUTHERN	SOCO_28_MSA_Birmingham_G			FPL_2_MSA_FortMyers_G	8701	7.2	5341	61%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	7.3	5241	60%	
	SOCO_15_MSA_Birmingham_G	8438	FRCC	FPL_3_MSA_Miami_L	8760		5246	60%	
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	1.4	4906	56%	
SOUTHERN	SOCO_31_MSA_Atlanta_G			FPL_3_MSA_Miami_L	8760		5242	60%	
	SOCO_32_MSA_Pascagoula_G		FRCC	FPL_3_MSA_Miami_L	8760	6.9	5294	60%	
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_3_MSA_Miami_L	8760	1.9	5236	60%	
SOUTHERN	SOCO_28_MSA_Birmingham_G		FRCC	FPL_3_MSA_Miami_L	8760		5244	60%	
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_7_MSA_Miami_L	8760		5277	60%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_7_MSA_Miami_L	8760		5277	60%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	7.2	5273	60%	
SOUTHERN	SOCO_15_MSA_Birmingham_G		FRCC	FPL_7_MSA_Miami_L	8760	7.7	5279	60%	
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	1.4	4971	57%	
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_7_MSA_Miami_L	8760	1.9	5289	60%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G		FRCC	FPL_7_MSA_Miami_L	8760	6.9	5323	61%	
MISO	XEL_3_MSA_Minneapolis_G	2885	MISO	GRE_4_MSA_Minneapolis_L	8760	14.0	6	0%	
MISO	ITC_3_MSA_Detroit_G	8745	ONTARIO	IESO_11_G	8760	2.5	7753	88%	
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_11_G	8760	3.0	6042	69%	
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_15_G	8760	2.8	5873	67%	
MISO	ITC_3_MSA_Detroit_G	8745	ONTARIO	IESO_15_G	8760	2.3	7255	83%	
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_3_L	8760	1.9	7882	90%	
MISO	ITC_3_MSA_Detroit_G	8745	ONTARIO	IESO_3_L	8760	1.5	7408	84%	
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.5	2582	29%	
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.4	6131	70%	
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	1.5	6188	70%	
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	1.6	2640	30%	
MISO	FE_9_MSA_Weirton_G	8760	MISO	ITC_2_MSA_Detroit_L	8625	1.5	6416	73%	

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MISO	FE_6_MSA_Pittsburgh_G	8592	MISO	ITC_2_MSA_Detroit_L	8625	1.6	6980	79%
MISO	FE_6_MSA_Pittsburgh_G	8592	MISO	ITC_9_MSA_Detroit_L	8760	1.5	7682	87%
MISO	FE_9_MSA_Weirton_G	8760	MISO	ITC_9_MSA_Detroit_L	8760	1.4	7322	83%
SPP	WEDE 1 MCA Manhattan C	8641	CDD	KACD 7 MCA KanagaCity I	8760	4.6	771	00/
MISO	WERE_1_MSA_Manhattan_G BREC 3 County Webster G			KACP_7_MSA_KansasCity_L LGEE_5_MSA_Lexington_L	8760		2763	9% 31%
MISO	WEC_1_MSA_Chicago_G			METC_8_MSA_Lexington_L METC_8_MSA_BayCity_G	8149	8.2	5208	59%
PJM	AEP_8_GEN_Amos01_G			METC_8_MSA_BayCity_G  METC_8_MSA_BayCity_G	8149	1.8	3176	36%
PJIVI	AEP_6_GEN_AMOSUI_G	6760	IVIISO	METC_6_MSA_BayCity_G	6149	1.0	3176	30%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	METC_9_MSA_Kalamazoo_L	8760	1.2	1194	14%
MISO	WEC_1_MSA_Chicago_G	8592	MISO	METC_9_MSA_Kalamazoo_L	8760	7.6	4687	53%
NYPP	NYISO 1 NYA	8310	NEPOOL	NEPOOL_10_RI	6779	6.3	6123	70%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_10_RI	6779	2.7	8760	100%
NEPOOL	NEPOOL_2_NH	8396	NEPOOL	NEPOOL_10_RI	6779	1.2	6923	79%
NEPOOL	NEPOOL_3_ME	3621	NEPOOL	NEPOOL_10_RI	6779	2.3	6904	79%
NEPOOL	NEPOOL_2_NH	8396	NEPOOL	NEPOOL_4_NEBOS	8727	1.7	6923	79%
NEPOOL	NEPOOL_3_ME	3621	NEPOOL	NEPOOL_4_NEBOS	8727	2.7	6920	79%
NYPP	NYISO_1_NYA	8310	NEPOOL	NEPOOL_4_NEBOS	8727	6.7	6123	70%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_4_NEBOS	8727	3.1	8760	100%
NEPOOL	NEPOOL_3_ME	3621	NEPOOL	NEPOOL_6_WCMA	8554	2.8	7027	80%
NEPOOL	NEPOOL_2_NH	8396	NEPOOL	NEPOOL_6_WCMA	8554	1.7	7045	80%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_6_WCMA	8554	3.2	8570	98%
	NYISO_1_NYA	8310	NEPOOL	NEPOOL_6_WCMA	8554	6.8	6125	70%
NEPOOL	NEPOOL_2_NH	8396	NEPOOL	NEPOOL_7_CT	1561	6.9	7640	87%
	NEPOOL_3_ME	3621	NEPOOL	NEPOOL_7_CT	1561	7.9	7617	87%
NYPP	NYISO_1_NYA	8310	NEPOOL	NEPOOL_7_CT	1561	11.9	6127	70%
NEPOOL	NEPOOL_5_SEMA	8760	NEPOOL	NEPOOL_7_CT	1561	5.1	2659	30%
	NYISO_8_NYH	8760	NEPOOL	NEPOOL_7_CT	1561	3.4	8752	100%
NYPP	NYISO_3_NYC			NEPOOL_7_CT	1561	8.3	8760	100%
NEPOOL	NEPOOL_8_SWCT			NEPOOL_7_CT	1561	1.1	7361	84%
NYPP	NYISO_6_NYF			NEPOOL_7_CT	1561	6.0	8749	100%
NEPOOL	NEPOOL_2_NH			NEPOOL_9_NWKST	8760		8758	100%
NYPP	NYISO_6_NYF	7576	NEPOOL	NEPOOL_9_NWKST	8760	2.3	8759	100%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_1_NYA	8310	NEPOOL	NEPOOL_9_NWKST	8760	8.2	6133	70%
NEPOOL	NEPOOL_7_CT	7199	NEPOOL	NEPOOL_9_NWKST	8760	1.4	8757	100%
NEPOOL	NEPOOL_5_SEMA	8760	NEPOOL	NEPOOL_9_NWKST	8760	1.4	8756	100%
NEPOOL	NEPOOL_3_ME	3621	NEPOOL	NEPOOL_9_NWKST	8760	4.2	8757	100%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_9_NWKST	8760	4.6	8760	100%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_13_MSA_Chicago_L	8760	6.4	2910	33%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_13_MSA_Chicago_L	8760	2.4	3987	45%
MISO	IP_8_GEN_Clinton_G	8002	PJM	NI_13_MSA_Chicago_L	8760	1.0	1287	15%
MISO	AMRN_12_MSA_StLouis_L	6277	PJM	NI_13_MSA_Chicago_L	8760	6.2	6423	73%
	NI_7_MSA_Rochelle_G	8760	PJM	NI_13_MSA_Chicago_L	8760	3.7	3161	36%
MISO	ALTE_2_MSA_Madison_G	8747	PJM	NI_13_MSA_Chicago_L	8760	6.3	4833	55%
MISO	WEC_1_MSA_Chicago_G	8592		NI_3_MSA_Chicago_L	8760	2.3	3712	42%
MISO	AMRN_12_MSA_StLouis_L	6277	PJM	NI_3_MSA_Chicago_L	8760	6.1	6374	73%
MISO	ALTE_2_MSA_Madison_G	8747	PJM	NI_3_MSA_Chicago_L	8760	6.2	4843	55%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_3_MSA_Chicago_L	8760	3.6	3198	36%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_3_MSA_Chicago_L	8760	6.2	2944	34%
MISO	ALTE_2_MSA_Madison_G	8747	PJM	NI_6_MSA_Chicago_G	1095	4.9	4510	51%
MISO	AMRN_12_MSA_StLouis_L	6277	PJM	NI_6_MSA_Chicago_G	1095	4.8	6423	73%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_6_MSA_Chicago_G	1095	4.9	2939	33%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_6_MSA_Chicago_G	1095	1.0	3985	45%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_6_MSA_Chicago_G	1095	2.3	3239	37%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_10_NYJ	8760	10.8	8760	100%
NYPP	NYISO_6_NYF	7576	NYPP	NYISO_10_NYJ	8760	4.1	8758	100%
	NEPOOL_5_SEMA	8760	NYPP	NYISO_10_NYJ	8760		8760	100%
NEPOOL	NEPOOL_7_CT	7199		NYISO_10_NYJ	8760	3.2	8758	100%
NEPOOL	NEPOOL_3_ME			NYISO_10_NYJ	8760	6.1	8760	100%
PJM	PENELEC_2_MSA_DuBois_G	8601		NYISO_10_NYJ	8760	9.1	6126	70%
NYPP	NYISO_1_NYA	8310	NYPP	NYISO_10_NYJ	8760	10.0	8759	100%
ONTARIO	IESO_2_G	1918	NYPP	NYISO_10_NYJ	8760	3.6	8760	100%
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_10_NYJ	8760	1.6	8759	100%
ONTARIO	IESO_6_G			NYISO_10_NYJ	8760		8760	100%
NYPP	NYISO_3_NYC	8760		NYISO_10_NYJ	8760	6.4	8758	100%
	NEPOOL_2_NH			NYISO_10_NYJ	8760		8760	100%
NEPOOL	NEPOOL_7_CT	7199	NYPP	NYISO_11_NYK	8760	3.7	8760	100%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub II	Market Area Hub Name Howard NYPP NYISO_8_NYH NYPP NYISO_1_NYA DNTARIO IESO_7_G NYPP NYISO_3_NYC NEPOOL NEPOOL_2_NH NEPOOL NEPOOL_5_SEMA NYPP NYISO_6_NYF NEPOOL NEPOOL_3_ME DNTARIO IESO_6_G DNTARIO IESO_6_G DNTARIO IESO_2_G NYPP NYISO_1_NYA DNTARIO IESO_6_G DNTARIO IESO_6_G DNTARIO IESO_6_G DNTARIO IESO_6_G DNTARIO IESO_6_G NYPP NYISO_1_NYA DNTARIO IESO_6_G NEPOOL NEPOOL_2_NH DNTARIO IESO_6_G NEPOOL NEPOOL_2_NH DNTARIO IESO_7_G NYPP NYISO_3_NYC NEPOOL NEPOOL_3_ME DNTARIO IESO_7_G NYPP NYISO_3_NYC NEPOOL NEPOOL_3_ME DNTARIO IESO_7_G NYPP NYISO_3_NYC NEPOOL NEPOOL_3_ME			ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_11_NYK	8760	2.1	8754	100%
NYPP	NYISO_1_NYA	8310		NYISO_11_NYK	8760	10.5	6130	70%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_11_NYK	8760	11.3	6130	70%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_11_NYK	8760		8760	100%
NEPOOL	NEPOOL_2_NH	8396	NYPP	NYISO_11_NYK	8760	5.5	8760	100%
NEPOOL	NEPOOL_5_SEMA	8760	NYPP	NYISO_11_NYK	8760	3.8	8760	100%
NYPP	NYISO_6_NYF	7576	NYPP	NYISO_11_NYK	8760	4.6	8760	100%
NEPOOL	NEPOOL_3_ME	3621	NYPP	NYISO_11_NYK	8760	6.6	8760	100%
PJM	PENELEC_2_MSA_DuBois_G	8601	NYPP	NYISO_11_NYK	8760	9.6	6130	70%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_11_NYK	8760	11.3	6130	70%
ONTARIO	IESO_2_G	1918	NYPP	NYISO_11_NYK	8760	4.1	6130	70%
NYPP	NYISO_1_NYA	8310	NYPP	NYISO_7_NYG	8164	6.7	6035	69%
PJM	PENELEC_2_MSA_DuBois_G	8601	NYPP	NYISO_7_NYG	8164	5.8	6074	69%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_7_NYG	8164	7.5	6109	70%
NEPOOL	NEPOOL_2_NH	8396	NYPP	NYISO_7_NYG	8164	1.6	6526	74%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_7_NYG	8164	7.4	6114	70%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_7_NYG	8164	3.1	5609	64%
NEPOOL	NEPOOL_3_ME	3621	NYPP	NYISO_7_NYG	8164	2.7	5962	68%
PJM	PENELEC_2_MSA_DuBois_G	8601	NYPP	NYISO_9_NYI	8288	8.5	6081	69%
NEPOOL	NEPOOL_2_NH	8396	NYPP	NYISO_9_NYI	8288	4.4	8743	100%
ONTARIO	IESO_2_G	1918	NYPP	NYISO_9_NYI	8288	3.0	6119	70%
NYPP	NYISO_6_NYF	7576	NYPP	NYISO_9_NYI	8288	3.5	8615	98%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_9_NYI	8288	10.2	6121	70%
NEPOOL	NEPOOL_3_ME	3621	NYPP	NYISO_9_NYI	8288	5.4	8741	100%
NEPOOL	NEPOOL_7_CT	7199	NYPP	NYISO_9_NYI	8288	2.6	8538	97%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_9_NYI	8288	5.8	8686	99%
NEPOOL	NEPOOL_5_SEMA	8760	NYPP	NYISO_9_NYI	8288	2.6	8630	98%
ONTARIO	IESO_7_G	8760		NYISO_9_NYI	8288	10.2	6123	70%
NYPP	NYISO_1_NYA		NYPP	NYISO_9_NYI	8288	9.4	6092	69%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_5_MSA_Tulsa_G	7078	SPP	_L	8742	19.3	6394	73%
		_		OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_2_MSA_Batesville_G	8743	SPP		8742	15.2	7720	88%
SPP	WERE 1 MSA Manhattan G	8641		OKGE 4 MSA OklahomaCity	8742	24.0	8218	94%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_9_MSA_MountPleasant_	7520	SPP	_L	8742	14.9	6720	77%
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_9_MSA_Russellville_G	2760	SPP	_L	8742	21.5	7335	84%
MAPP	NPPD_4_GEN_Gentleman_G	8240	MAPP	OPPD_5_MSA_Omaha_L	8760	6.2	7560	86%
PJM	BGE_7_MSA_Baltimore-Towson	7816	PJM	PECO_5_MSA_Philadelphia_L	6966	2.7	3910	45%
PJM	PJM500_4_MSA_Philadelphia_G	8690	PJM	PECO_5_MSA_Philadelphia_L	6966	3.7	0	0%
PJM	PJM500_7_MSA_York-Hanover_	8760		PECO_5_MSA_Philadelphia_L	6966		1444	16%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PEPCO_1_MSA_DC_L	8760		7624	87%
PJM	PJM500_9_MSA_Pittsburgh_G	8664		PEPCO_1_MSA_DC_L	8760		7616	87%
PJM	AP_1_County_Harrison_G	8760		PEPCO_1_MSA_DC_L	8760		7622	87%
PJM	PJM500_9_MSA_Pittsburgh_G	8664			8760		5782	66%
PJM	PENELEC_2_MSA_DuBois_G	8601		PL_5_MSA_Lancaster_L	8760		7664	87%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PL_5_MSA_Lancaster_L	8760		7234	82%
PJM	PENELEC_2_MSA_DuBois_G	8601		PL_7_MSA_Allentown_L	8760		7259	83%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PL_7_MSA_Allentown_L	8760		8264	94%
PJM	PJM500_9_MSA_Pittsburgh_G	8664		PL_7_MSA_Allentown_L	8760		7353	84%
NYPP	NYISO_3_NYC	8760		PSEG_3_MSA_NewYork_L	8760		8075	92%
NYPP	NYISO_1_NYA	8310		PSEG_3_MSA_NewYork_L	8760		8154	93%
NYPP	NYISO_6_NYF	7576	PJM	PSEG_3_MSA_NewYork_L	8760	1.2	8146	93%
NYPP	NYISO_3_NYC	8760	PJM	PSEG_5_MSA_Philadelphia_L	8760	3.9	7743	88%
NYPP	NYISO_1_NYA	8310	PJM	PSEG_5_MSA_Philadelphia_L	8760	7.5	8156	93%
NYPP	NYISO_6_NYF	7576		PSEG_5_MSA_Philadelphia_L	8760		8181	93%
NYPP	NYISO_3_NYC	8760	PJM	PSEG_8_MSA_NewYork_G	8760		8005	91%
NYPP	NYISO_1_NYA	8310		PSEG_8_MSA_NewYork_G	8760	7.1	8043	92%
NYPP	NYISO_6_NYF	7576	PJM	PSEG_8_MSA_NewYork_G	8760	1.2	7974	91%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCEG_9_MSA_Charleston_G	8669	1.0	2133	24%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub I	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	VACAR	SCEG_9_MSA_Charleston_G	8669	1.1	2120	24%
VACAR	SCPSA_10_MSA_Charleston_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.5	1653	19%
VACAR	CPLE_1_MSA_Durham_G	7607	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.2	2121	24%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.4	4349	50%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.3	4349	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.9	4350	50%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.6	4791	55%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.9	983	11%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8438	SOUTHERN	_	7956	2.1	479	5%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7963	SOUTHERN	_	7956	1.2	720	8%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	_	7956	2.8	764	9%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN		7956	4.9	2390	27%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	1.5	428	5%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	SOUTHERN		7956	1.6	443	5%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	4.6	491	6%
VACAR	DUK_9_MSA_Charlotte_G	8544	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	2.4	629	7%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7956	11.4	3124	36%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		urs         Differential         Hours           7956         2.0         489           8760         3.0         91           8760         3.3         1580           8760         9.9         2924           8760         1.2         387           7378         1.7         3196           7378         1.4         2947           7378         8.3         2961           8673         2.7         86           8673         3.0         1959           8673         9.6         2918           8760         1.2         547		
		Source			Sink			
Market Area	Hub Name	Hours	Market Area		Hours			U90 %
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	SOUTHERN	SOCO_10_MSA_Albany-Valdo	7956	2.0	489	6%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_16_MSA_Atlanta_L	8760			1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	3.3	1580	18%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	9.9	2924	33%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	1.2	387	4%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	1.7	3196	36%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	1.4	2947	34%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_17_MSA_Mobile_G	7378	8.3	2961	34%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_21_MSA_Atlanta_G	8673			1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_21_MSA_Atlanta_G	8673	3.0	1959	22%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_21_MSA_Atlanta_G	8673	9.6	2918	33%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	1.2	547	6%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3.0	244	3%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	9.9	3007	34%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3.3	1733	20%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	10.0	3058	35%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	1.3	626	7%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.1	372	4%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.4	1787	20%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				SOCO_6_MSA_Augusta-				
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G		SOUTHERN		8760	3.0	63	1%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_6_MSA_Augusta-Richm	8760	3.4	1400	16%
				SOCO_6_MSA_Augusta-				
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	Richmond_L	8760	9.9	2743	31%
				SOCO_6_MSA_Augusta-				
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	Richmond_L	8760	1.3	337	4%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8755	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	3.0	241	3%
ENTERGY	EES_9_MSA_Russellville_G	2760	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	9.9	3006	34%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	3.3	1717	20%
	EES_10_MSA_Vicksburg_G			SOCO_8_MSA_Atlanta_L	8760		547	6%
	EES_9_MSA_Russellville_G			TVA_3_MSA_Knoxville_L	8760		2879	33%
	LGEE_3_GEN_Gehnt2_G			TVA_3_MSA_Knoxville_L	8760		4983	57%
	EKPC_8_MSA_Maysville_G			TVA_5_MSA_Nashville_L	8677	1.4	1244	14%
	EES_9_MSA_Russellville_G			TVA_5_MSA_Nashville_L	8677	7.0	2797	32%
	BREC_3_County_Webster_G			TVA_5_MSA_Nashville_L	8677	5.3	6736	77%
MISO	LGEE_3_GEN_Gehnt2_G			TVA_5_MSA_Nashville_L	8677	4.7	6183	70%
	AECI_4_GEN_NewMadrid1_G			TVA_5_MSA_Nashville_L	8677	3.6	2591	29%
	EES_9_MSA_Russellville_G			TVA_7_MSA_Memphis_L	8745		790	9%
	LGEE_3_GEN_Gehnt2_G			TVA_7_MSA_Memphis_L	8745		5269	60%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		VAP_15_MSA_VB-Norfolk_L	8760		7756	88%
VACAR	CPLE_1_MSA_Durham_G	7607		VAP_15_MSA_VB-Norfolk_L	8760		6570	75%
PJM	VAP_7_G	6808		VAP_15_MSA_VB-Norfolk_L	8760	1.0	5582	64%
PJM	PJM500_9_MSA_Pittsburgh_G	8664		VAP_15_MSA_VB-Norfolk_L	8760		7745	88%
PJM	AP_1_County_Harrison_G	8760		VAP_15_MSA_VB-Norfolk_L	8760		7684	87%
PJM	AEP_8_GEN_Amos01_G	8760		VAP_15_MSA_VB-Norfolk_L	8760		8020	91%
PJM	VAP_7_G	6808		VAP_27_MSA_DC_L	8760		5537	63%
PJM	VAP_1_MSA_Richmond_G	8760		VAP_27_MSA_DC_L	8760		3050	35%
PJM	AEP_8_GEN_Amos01_G	8760		VAP_27_MSA_DC_L	8760		8018	91%
VACAR	CPLE_1_MSA_Durham_G	7607	PJM	VAP_27_MSA_DC_L	8760	6.9	7534	86%

Task 2: Appendix 5, Corridor Congestion by Scenario BaseCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_27_MSA_DC_L	8760	7.5	7671	87%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_27_MSA_DC_L	8760	7.3	7696	88%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_27_MSA_DC_L	8760	6.9	7616	87%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_33_MSA_DC_L	8760	7.5	7707	88%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_33_MSA_DC_L	8760	7.0	7772	88%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_33_MSA_DC_L	8760	11.2	8151	93%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_33_MSA_DC_L	8760	7.3	7772	88%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_33_MSA_DC_L	8760	1.5	3756	43%
VACAR	CPLE_1_MSA_Durham_G	7607	PJM	VAP_33_MSA_DC_L	8760	6.9	7702	88%
PJM	VAP_7_G	6808	PJM	VAP_33_MSA_DC_L	8760	3.1	5547	63%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_7_G	1952	16.5	7222	82%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_7_G	1952	16.7	5725	65%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_7_G	1952	10.7	5484	62%
PJM	PJM500_7_MSA_York-Hanover_	8760	PJM	VAP_7_G	1952	8.7	6107	70%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_7_G	1952	20.4	6178	70%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_7_G	1952	16.2	7260	83%
PJM	PJM500_4_MSA_Philadelphia_G	8690	PJM	VAP_7_G	1952	8.8	5739	65%
PJM	PJM500_5_MSA_DC_G	8760	PJM	VAP_7_G	1952	8.1	5131	58%
VACAR	CPLE_1_MSA_Durham_G	7607	PJM	VAP_7_G	1952	16.1	5448	62%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	SPP	WERE_4_GEN_Wolfcreek_G	4485	7.7	7905	90%
SPP	KACP_4_MSA_KansasCity_G	7896		WERE_4_GEN_Wolfcreek_G	4485	29.6	7378	84%
SPP	AEPW_5_MSA_Tulsa_G	7078	SPP	WERE_4_GEN_Wolfcreek_G	4485	8.8	4175	48%
SPP	WERE_1_MSA_Manhattan_G	8641	SPP	WERE_4_GEN_Wolfcreek_G	4485	13.6	1182	13%
	NPPD_4_GEN_Gentleman_G	8240		WERE_4_GEN_Wolfcreek_G	4485		8734	99%
MISO	ALTE_2_MSA_Madison_G			XEL_3_MSA_Minneapolis_G	5875		2794	32%
MISO	OTP_9_GEN_BigStone_G	8640	MISO	XEL_3_MSA_Minneapolis_G	5875	26.8	8641	98%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
MISO	FE_6_MSA_Pittsburgh_G		PJM	AEP_1_MSA_Lynchburg_G	8760	1.2	6619	75%
MISO	NIPS_8_MSA_Chicago_G	8643	PJM	AEP_1_MSA_Lynchburg_G	8760	5.1	4070	46%
PJM	NI_20_MSA_Chicago_G	7868	PJM	AEP_1_MSA_Lynchburg_G	8760	5.0	4098	47%
PJM	NI_15_MSA_Davenport_G		PJM	AEP_1_MSA_Lynchburg_G	8760	13.1	4729	54%
PJM	NI_7_MSA_Rochelle_G		PJM	AEP_1_MSA_Lynchburg_G	8760	9.6	5243	60%
PJM	NI_6_MSA_Chicago_G	7271	PJM	AEP_1_MSA_Lynchburg_G	8760	4.4	4299	49%
PJM	NI_2_MSA_Chicago_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8760	4.8	4280	49%
MISO	AMRN_12_MSA_StLouis_L	6286	PJM	AEP_1_MSA_Lynchburg_G	8760	13.2	7137	81%
MISO	IPL_2_MSA_Jasper_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8760	4.3	6892	78%
PJM	NI_6_MSA_Chicago_G	7271	PJM	AEP_2_STA_TN-WV_L	8760	4.6	1401	16%
MISO	NIPS_8_MSA_Chicago_G	8643	PJM	AEP_2_STA_TN-WV_L	8760	5.3	1166	13%
PJM	NI_20_MSA_Chicago_G	7868	PJM	AEP_2_STA_TN-WV_L	8760	5.2	1242	14%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	9.8	3386	39%
PJM	NI_2_MSA_Chicago_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	5.0	1386	16%
MISO	LGEE_3_GEN_Gehnt2_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	5.7	5053	58%
MISO	AMRN_12_MSA_StLouis_L	6286	PJM	AEP_2_STA_TN-WV_L	8760	13.4	6244	71%
PJM	NI_15_MSA_Davenport_G	8712	PJM	AEP_2_STA_TN-WV_L	8760	13.3	2778	32%
MISO	IPL_2_MSA_Jasper_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	4.5	6210	71%
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AEP_2_STA_TN-WV_L	8760	1.4	5365	61%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8760	PJM	Massillon_L	8760	5.0	1559	18%
				AEP_9_MSA_Canton-				
PJM	NI_6_MSA_Chicago_G	7271	PJM	Massillon_L	8760	4.6	1558	18%
				AEP_9_MSA_Canton-				
PJM	NI_7_MSA_Rochelle_G	8760	PJM	Massillon_L	8760	9.8	3806	43%
				AEP_9_MSA_Canton-				
PJM	NI_15_MSA_Davenport_G	8712	PJM	Massillon_L	8760	13.3	3361	38%
				AEP_9_MSA_Canton-				
MISO	NIPS_8_MSA_Chicago_G	8643	PJM	Massillon_L	8760	5.3	1172	13%
				AEP_9_MSA_Canton-				
PJM	NI_20_MSA_Chicago_G	7868	PJM	Massillon_L	8760	5.1	1557	18%
				AEP_9_MSA_Canton-				
MISO	IPL_2_MSA_Jasper_G	8760	PJM	Massillon_L	8760	4.5	6405	73%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
				AEP_9_MSA_Canton-				
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	Massillon_L	8760	1.4	4647	53%
				AEP_9_MSA_Canton-				
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	Massillon_L	8760	1.5	4750	54%
				AEP_9_MSA_Canton-				
MISO	AMRN_12_MSA_StLouis_L	6286	PJM	Massillon_L	8760	13.4	6519	74%
PJM	NI_20_MSA_Chicago_G	7868	MISO	AMRN_12_MSA_StLouis_L	2474	9.5	951	11%
TVAUTHOR	TVA_4_MSA_Clarksville_G		MISO	AMRN_12_MSA_StLouis_L	2474	3.0	1276	15%
PJM	NI_2_MSA_Chicago_G	8760	MISO	AMRN_12_MSA_StLouis_L	2474	9.4	1265	14%
MAPP	MEC_3_MSA_DesMoines_G	8371	MISO	AMRN_12_MSA_StLouis_L	2474	28.1	2364	27%
PJM	NI_15_MSA_Davenport_G		MISO	AMRN 12 MSA StLouis L	2474		2572	29%
PJM	NI_7_MSA_Rochelle_G		MISO	AMRN_12_MSA_StLouis_L	2474		3556	40%
MISO	CIN_8_MSA_Evansville_G		MISO	AMRN_12_MSA_StLouis_L	2474		6183	70%
MISO	IP_7_GEN_Baldwin_G		MISO	AMRN_12_MSA_StLouis_L	2474		0	0%
MISO	IP_8_GEN_Clinton_G		MISO	AMRN_12_MSA_StLouis_L	2474	11.1	446	5%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	AMRN_12_MSA_StLouis_L	2474	4.3	64	1%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	MISO	AMRN 12 MSA StLouis L	2474	6.9	2961	34%
PJM	NI_6_MSA_Chicago_G	7271	MISO	AMRN_12_MSA_StLouis_L	2474	9.0	1277	15%
PJM	NI_15_MSA_Davenport_G	8712	MISO	AMRN_2_County_Macon_L	8760	8.0	4183	48%
PJM	NI_7_MSA_Rochelle_G	8760	MISO	AMRN_2_County_Macon_L	8760	4.5	4638	53%
MISO	IP_7_GEN_Baldwin_G	8760	MISO	AMRN_2_County_Macon_L	8760	4.6	4366	50%
MISO	AMRN_12_MSA_StLouis_L	6286	MISO	AMRN_2_County_Macon_L	8760	8.1	4142	47%
MISO	IP_8_GEN_Clinton_G	7994	MISO	AMRN_2_County_Macon_L	8760	1.4	222	3%
MAPP	MEC_3_MSA_DesMoines_G	8371	MISO	AMRN_2_County_Macon_L	8760	18.4	4402	50%
MISO	FE_9_MSA_Weirton_G	8760	PJM	AP_2_GEN_Albright3_L	8760	3.4	5077	58%
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AP_2_GEN_Albright3_L	8760	3.9	4980	57%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_2_GEN_Albright3_L	8760	2.5	6277	71%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	AP_2_GEN_Albright3_L	8760	4.1	5086	58%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Martinsburg_L	8760	11.8	7629	87%
				AP_7_MSA_Hagerstown-				
PJM	VAP_7_G	6600	PJM	Martinsburg_L	8760	3.9	5104	58%
				AP_7_MSA_Hagerstown-				
PJM	VAP_1_MSA_Richmond_G	8760	PJM	Martinsburg_L	8760	2.3	4599	52%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	Congestion Indicators			
		Source			Sink	Price	U90				
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %			
				AP_7_MSA_Hagerstown-							
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Martinsburg_L	8760	11.2	7611	87%			
				AP_7_MSA_Hagerstown-							
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	Martinsburg_L	8760	19.3	8182	93%			
				AP_7_MSA_Hagerstown-							
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	Martinsburg_L	8760	19.5	8199	93%			
				AP_7_MSA_Hagerstown-							
PJM	AP_1_County_Harrison_G	8760		Martinsburg_L	8760	11.8	7553	86%			
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_7_MSA_Hagerstown-Martir	8760	17.9	8324	95%			
				AP_7_MSA_Hagerstown-							
MISO	FE_9_MSA_Weirton_G	8760		Martinsburg_L	8760	18.8	8196	93%			
PJM	VAP_1_MSA_Richmond_G	8760		AP_8_MSA_DC-VA-MD_L	8760	3.1	3836	44%			
PJM	PJM500_9_MSA_Pittsburgh_G	8664		AP_8_MSA_DC-VA-MD_L	8760	12.0	7699	88%			
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	12.5	7675	87%			
	FE_9_MSA_Weirton_G	8760		AP_8_MSA_DC-VA-MD_L	8760		8216	94%			
	DLCO_7_MSA_Pittsburgh_G	8232		AP_8_MSA_DC-VA-MD_L	8760		8216	94%			
PJM	VAP_7_G	6600		AP_8_MSA_DC-VA-MD_L	8760		5382	61%			
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	18.6	8020	91%			
PJM	AP_1_County_Harrison_G	8760		AP_8_MSA_DC-VA-MD_L	8760	12.5	7599	87%			
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AP_8_MSA_DC-VA-MD_L	8760	20.0	8198	93%			
				BGE_10_MSA_Baltimore-							
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Towson_L	8760	13.5	7641	87%			
				BGE_10_MSA_Baltimore-							
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	14.0	7700	88%			
				BGE_5_MSA_Baltimore-							
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	13.9	7696	88%			
				BGE_5_MSA_Baltimore-							
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Towson_L	8760	13.3	7634	87%			
				BGE_9_MSA_Baltimore-							
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	14.5	7711	88%			
				BGE_9_MSA_Baltimore-							
PJM	PJM500_9_MSA_Pittsburgh_G	8664		Towson_L	8760	14.0	7670	87%			
	NIPS_8_MSA_Chicago_G		MISO	CIN_1_MSA_Indianapolis_L	8760		524	6%			
MISO	LGEE_3_GEN_Gehnt2_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	2.7	4959	56%			

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MISO	CIN_8_MSA_Evansville_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.5	2912	33%
MISO	AMRN_12_MSA_StLouis_L	6286	MISO	CIN_1_MSA_Indianapolis_L	8760	10.4	3394	39%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.5	2711	31%
	NIPS_8_MSA_Chicago_G	8643	MISO	CIN_7_MSA_Lafayette_L	8760	1.4	502	6%
MISO	LGEE_3_GEN_Gehnt2_G	8760	MISO	CIN_7_MSA_Lafayette_L	8760	1.8	5772	66%
VACAR	SCEG_1_MSA_Columbia_G	7998	VACAR	CPLE_1_MSA_Durham_G	830	10.1	2292	26%
PJM	VAP_7_G	6600	VACAR	CPLE_1_MSA_Durham_G	830	2.7	4936	56%
VACAR	SCPSA_10_MSA_Charleston_G			CPLE_1_MSA_Durham_G	830	10.9	1324	15%
VACAR	DUK_9_MSA_Charlotte_G	8549	VACAR	CPLE_1_MSA_Durham_G	830	12.6	555	6%
VACAR	DUK_5_MSA_Seneca_G	6330	VACAR	CPLE_1_MSA_Durham_G	830	4.9	4626	53%
PJM	VAP_1_MSA_Richmond_G	8760	VACAR	CPLE_1_MSA_Durham_G	830	1.0	563	6%
	AEP_8_GEN_Amos01_G	8760		CPLE_1_MSA_Durham_G	830	16.6	6778	77%
	AEP_8_GEN_Amos01_G	8760		DUK_4_MSA_Greenville_L	6832	4.3	4035	46%
	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_8_MSA_Charlotte_L	8760	4.8	3772	43%
VACAR	SCEG_1_MSA_Columbia_G	7998	VACAR	DUK_9_MSA_Charlotte_G	211	33.9	181	2%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	VACAR	DUK_9_MSA_Charlotte_G	211	34.1	2560	29%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760		DUK_9_MSA_Charlotte_G	211	35.5	802	9%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	35.8	2756	31%
SOUTHERN	SOCO_26_MSA_Macon_G			DUK_9_MSA_Charlotte_G	211	35.4	527	6%
	SOCO_17_MSA_Mobile_G	1894	VACAR	DUK_9_MSA_Charlotte_G	211	30.1	2781	32%
	SOCO_15_MSA_Birmingham_G			DUK_9_MSA_Charlotte_G	211	35.8	2712	31%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	40.4	3971	45%
VACAR	CPLE_1_MSA_Durham_G			DUK_9_MSA_Charlotte_G	211	33.8	290	3%
VACAR	DUK_5_MSA_Seneca_G			DUK_9_MSA_Charlotte_G	211	28.7	34	0%
SPP	AEPW_5_MSA_Tulsa_G			EES_1_MSA_Jackson_L	8760		3124	36%
SPP	AEPW_9_MSA_MountPleasant_	8404	ENTERGY	EES_1_MSA_Jackson_L	8760	1.6	8741	100%
ENTERGY	EES_4_GEN_Ouachita_G	6519	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.5	6455	73%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.6	6450	73%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.4	6495	74%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.4	7072	81%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.6	7017	80%
ENTERGY	EES_8_MSA_BatonRouge_G	8496	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.7	5423	62%
OOLITUEDA.	0000 45 1404 5: : .	0507	ENITEDOV		0700		70.44	000/
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	ENTERGY	EES_5_MSA_NewOrleans_G	8760	6.6	7041	80%
COLITHEDA	SOCO_26_MSA_Macon_G	9760	ENTERGY	EES E MSA NowOrloops C	8760	6.2	7101	010/
SOUTHERN	SOCO_26_WSA_Wacon_G	0700	ENTERGI	EES_5_MSA_NewOrleans_G	0700	0.2	7101	81%
SPP	AEPW_5_MSA_Tulsa_G	7582	ENTERGY	EES_5_MSA_NewOrleans_G	8760	13.2	6883	78%
01 1	ALI W_5_MOA_Tuisa_6	7002	LIVILIVOI	LEG_G_MG/ (_NewGricaris_G	0700	10.2	0000	7070
SPP	AEPW_9_MSA_MountPleasant_	8404	ENTERGY	EES_5_MSA_NewOrleans_G	8760	8.9	8733	99%
							0.00	0070
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	ENTERGY	EES_5_MSA_NewOrleans_G	8760	5.0	6704	76%
				EES_7_MSA_Beaumont-				
SPP	AEPW_5_MSA_Tulsa_G	7582	ENTERGY	PortArthur_G	7005	7.2	4350	50%
				EES_7_MSA_Beaumont-				
SPP	AEPW_9_MSA_MountPleasant_			PortArthur_G	7005	3.0	8735	99%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	ENTERGY	EES_9_MSA_Russellville_G	6267		2	0%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	ENTERGY	EES_9_MSA_Russellville_G	6267		3657	42%
	TVA_1_MSA_Chatt-Hunts_G			EES_9_MSA_Russellville_G	6267		2108	24%
	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_9_MSA_Russellville_G	6267		0	0%
SOUTHERN	SOCO_31_MSA_Atlanta_G			EES_9_MSA_Russellville_G	6267	2.1	1536	17%
	SOCO_26_MSA_Macon_G	8760	ENTERGY	EES_9_MSA_Russellville_G	6267	1.9	2012	23%
SPP	AEPW_9_MSA_MountPleasant_	8404	ENTERGY	EES_9_MSA_Russellville_G	6267	4.7	8740	99%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	ENTERGY	EES_9_MSA_Russellville_G	6267	2.4	1582	18%
ENTERGY	EES_2_MSA_Batesville_G	8743	ENTERGY	EES_9_MSA_Russellville_G	6267	5.6	1825	21%
SPP	AEPW_5_MSA_Tulsa_G	7582	ENTERGY	EES_9_MSA_Russellville_G	6267	8.9	260	3%
	AECI_4_GEN_NewMadrid1_G			EES_9_MSA_Russellville_G	6267	9.6	3914	45%
	SOCO_28_MSA_Birmingham_G	8760	ENTERGY	EES_9_MSA_Russellville_G	6267	2.4	2119	24%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	MISO	FE_4_MSA_Akron_L	8760	1.4	4202	48%
	FE_6_MSA_Pittsburgh_G	8592	MISO	FE_4_MSA_Akron_L	8760	1.2	4085	47%
	FE_6_MSA_Pittsburgh_G	8592	MISO	FE_5_MSA_Cleveland_L	7570	2.9	4694	53%
	FE_9_MSA_Weirton_G	8760	MISO	FE_5_MSA_Cleveland_L	7570	2.4	2462	28%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	AEP_8_GEN_Amos01_G	8760	MISO	FE_5_MSA_Cleveland_L	7570	1.5	4094	47%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	MISO	FE_5_MSA_Cleveland_L	7570	3.1	4795	55%
MISO	FE_6_MSA_Pittsburgh_G	8592	MISO	FE_7_MSA_Toledo_L	8710	2.3	6382	73%
MISO	FE_9_MSA_Weirton_G	8760	MISO	FE_7_MSA_Toledo_L	8710	1.9	5376	61%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	MISO	FE_7_MSA_Toledo_L	8710	2.5	6449	73%
PJM	DLCO_7_MSA_Pittsburgh_G	8232	MISO	FE_8_MSA_Youngstown_L	8760	1.0	107	1%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	FRCC	FPC_3_MSA_Orlando_L	8760	7.7	5088	58%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	9.0	4973	57%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	9.3	4975	57%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	FRCC	FPC_3_MSA_Orlando_L	8760	3.6	5043	57%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	FRCC	FPC_3_MSA_Orlando_L	8760	9.3	4976	57%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	8.9	4964	57%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	9.7	5363	61%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	FRCC	FPC_4_MSA_Tampa_L	8760	8.4	5439	62%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	10.1	5368	61%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	FRCC	FPC_4_MSA_Tampa_L	8760	4.3	5405	62%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	FRCC	FPC_4_MSA_Tampa_L	8760	10.1	5368	61%
FRCC	OUC_1_MSA_Orlando_G	8688	FRCC	FPC_4_MSA_Tampa_L	8760	1.3	4809	55%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	9.8	5369	61%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8709	10.9	5615	64%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	FRCC	FPL_2_MSA_FortMyers_G	8709	5.6	5660	64%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_2_MSA_FortMyers_G	8709	2.2	5162	59%
FRCC	JEA_6_MSA_Jacksonville_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8709	1.1	4109	47%
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8709	1.6	4137	47%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8709	11.4	5616	64%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8709	11.1	5615	64%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	FRCC	FPL_2_MSA_FortMyers_G	8709	9.7	5680	65%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	FRCC	FPL_2_MSA_FortMyers_G	8709	11.3	5618	64%
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	2.5	4877	56%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_3_MSA_Miami_L	8760	3.0	5257	60%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	FRCC	FPL_3_MSA_Miami_L	8760	10.5	5614	64%
	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	11.9	5552	63%
	SOCO_28_MSA_Birmingham_G			FPL_3_MSA_Miami_L	8760		5552	63%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	11.7	5550	63%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		12.2 5553 1.5 4261 2.0 3650 1.0 3155 6.4 5597 3.0 5309 12.2 5578 1.0 3169 1.5 4371 2.0 3779 2.4 4980 6.4 5621 11.7 5576 12.2 5575 11.9 5575 10.5 5635 21.6 4 4.2 7837 5.0 5778		
		Source			Sink	Price	U90	
Market Area	Hub Name		Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	FRCC	FPL_3_MSA_Miami_L	8760	12.2	5553	63%
FRCC	FPC_10_MSA_Lakeland_G	8320	FRCC	FPL_3_MSA_Miami_L	8760	1.5	4261	49%
FRCC	JEA_6_MSA_Jacksonville_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	2.0	3650	42%
FRCC	FPL_8_MSA_PortStLucie_G	8628	FRCC	FPL_3_MSA_Miami_L	8760	1.0	3155	36%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	FRCC	FPL_3_MSA_Miami_L	8760	6.4	5597	64%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_7_MSA_Miami_L	8760	3.0	5309	60%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	FRCC	FPL_7_MSA_Miami_L	8760	12.2	5578	64%
FRCC	FPL_8_MSA_PortStLucie_G	8628	FRCC	FPL_7_MSA_Miami_L	8760	1.0	3169	36%
FRCC	FPC_10_MSA_Lakeland_G	8320	FRCC	FPL_7_MSA_Miami_L	8760	1.5	4371	50%
FRCC	JEA_6_MSA_Jacksonville_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	2.0	3779	43%
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	2.4	4980	57%
SOUTHERN	SOCO_17_MSA_Mobile_G	1894	FRCC	FPL_7_MSA_Miami_L	8760	6.4	5621	64%
SOUTHERN	SOCO_26_MSA_Macon_G		FRCC	FPL_7_MSA_Miami_L	8760		5576	63%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	12.2	5575	63%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	11.9	5575	63%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	FRCC	FPL_7_MSA_Miami_L	8760	10.5	5635	64%
MISO	XEL_3_MSA_Minneapolis_G	2891	MISO	GRE_4_MSA_Minneapolis_L	8760	21.6	4	0%
MISO	ITC_3_MSA_Detroit_G		ONTARIO	IESO_11_G	8760	4.2	7837	89%
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_11_G	8760	5.0	5778	66%
MISO	ITC_3_MSA_Detroit_G	8744	ONTARIO	IESO_15_G	8760	4.0	7395	84%
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_15_G	8760	4.7	5707	65%
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_2_G	6935	1.0	7620	87%
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_3_L	8760	3.5	8038	92%
MISO	ITC_3_MSA_Detroit_G	8744	ONTARIO	IESO_3_L	8760	2.8	7520	86%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.9	2435	28%
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.9	6102	69%
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	1.9	6136	70%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	2.0	2471	28%
MISO	FE_9_MSA_Weirton_G		MISO	ITC_2_MSA_Detroit_L	8624	3.2	6691	76%
MISO	FE_6_MSA_Pittsburgh_G		MISO	ITC_2_MSA_Detroit_L	8624	3.7	7278	83%
MISO	FE_6_MSA_Pittsburgh_G		MISO	ITC_9_MSA_Detroit_L	8760	3.5	7896	90%
MISO	FE_9_MSA_Weirton_G	8760	MISO	ITC_9_MSA_Detroit_L	8760	3.0	7535	86%
SPP	WERE_1_MSA_Manhattan_G	8684	SPP	KACP_7_MSA_KansasCity_L	8760	6.4	757	9%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
MISO	BREC_3_County_Webster_G	8760	MISO	LGEE_5_MSA_Lexington_L	8760	4.0	3283	37%
MISO	LGEE_3_GEN_Gehnt2_G	8760		LGEE_5_MSA_Lexington_L	8760	1.0	4322	49%
MISO	WEC_1_MSA_Chicago_G	8592	MISO	METC_8_MSA_BayCity_G	8173	12.3	5315	61%
MISO	ITC_7_MSA_Monroe_G	8472	MISO	METC_8_MSA_BayCity_G	8173	1.3	3286	37%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	METC_8_MSA_BayCity_G	8173	2.8	3405	39%
PJM	AEP_8_GEN_Amos01_G	8760	MISO	METC_9_MSA_Kalamazoo_L	8760	2.2	1541	18%
	WEC_1_MSA_Chicago_G			METC_9_MSA_Kalamazoo_L	8760	11.7	4823	55%
NEPOOL	NEPOOL_3_ME	3787	NEPOOL	NEPOOL_10_RI	6427	3.3	7160	82%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_10_RI	6427	4.8	8760	100%
NYPP	NYISO_1_NYA	8292	NEPOOL	NEPOOL_10_RI	6427	12.6	5832	66%
NEPOOL	NEPOOL_2_NH	8425	NEPOOL	NEPOOL_10_RI	6427	1.9	7181	82%
	NYISO_1_NYA	8292	NEPOOL	NEPOOL_3_ME	4973	4.3	5832	66%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_4_NEBOS	8715	5.7	8760	100%
NYPP	NYISO_1_NYA	8292	NEPOOL	NEPOOL_4_NEBOS	8715	13.5	5832	66%
NEPOOL	NEPOOL_3_ME	3787	NEPOOL	NEPOOL_4_NEBOS	8715	4.2	7176	82%
NEPOOL	NEPOOL_2_NH	8425	NEPOOL	NEPOOL_4_NEBOS	8715	2.8	7182	82%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_6_WCMA	8644	5.8	8612	98%
NYPP	NYISO_1_NYA	8292	NEPOOL	NEPOOL_6_WCMA	8644	13.6	5836	66%
NEPOOL	NEPOOL_3_ME	3787	NEPOOL	NEPOOL_6_WCMA	8644	4.3	7245	82%
NEPOOL	NEPOOL_2_NH	8425	NEPOOL	NEPOOL_6_WCMA	8644	2.9	7267	83%
NEPOOL	NEPOOL_5_SEMA	8739	NEPOOL	NEPOOL_7_CT	1543	11.0	2199	25%
NEPOOL	NEPOOL_2_NH	8425	NEPOOL	NEPOOL_7_CT	1543	13.9	7798	89%
	NEPOOL_8_SWCT	6228	NEPOOL	NEPOOL_7_CT	1543	4.1	7476	85%
NYPP	NYISO_1_NYA	8292	NEPOOL	NEPOOL_7_CT	1543	24.6	5836	66%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_7_CT	1543	16.8	8760	100%
NYPP	NYISO_6_NYF	7512	NEPOOL	NEPOOL_7_CT	1543	11.7	8757	100%
	NEPOOL_3_ME	3787	NEPOOL	NEPOOL_7_CT	1543	15.4	7777	89%
NYPP	NYISO_8_NYH	8760	NEPOOL	NEPOOL_7_CT	1543	7.2	8756	100%
NEPOOL	NEPOOL_3_ME	3787	NEPOOL	NEPOOL_9_NWKST	8760	6.9	8756	100%
NEPOOL	NEPOOL_5_SEMA	8739	NEPOOL	NEPOOL_9_NWKST	8760	2.6	8757	100%
NYPP	NYISO_1_NYA	8292	NEPOOL	NEPOOL_9_NWKST	8760	16.2	5840	66%
	NYISO_6_NYF	7512	NEPOOL	NEPOOL_9_NWKST	8760	3.3	8760	100%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_9_NWKST	8760	8.4	8760	100%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NEPOOL	NEPOOL_2_NH	8425	NEPOOL	NEPOOL_9_NWKST	8760	5.5	8758	100%
NEPOOL	NEPOOL_7_CT	7217	NEPOOL	NEPOOL_9_NWKST	8760	3.0	8757	100%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_13_MSA_Chicago_L	8760	4.4	4034	46%
	ALTE_2_MSA_Madison_G	8749	PJM	NI_13_MSA_Chicago_L	8760	8.0	4790	55%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_13_MSA_Chicago_L	8760	4.7	2893	33%
	AMRN_12_MSA_StLouis_L	6286	PJM	NI_13_MSA_Chicago_L	8760	8.4	6268	71%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_13_MSA_Chicago_L	8760	8.2	2519	29%
MISO	IP_8_GEN_Clinton_G	7994	PJM	NI_13_MSA_Chicago_L	8760	1.6	1092	12%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_3_MSA_Chicago_L	8760	4.2	3788	43%
	IP_8_GEN_Clinton_G	7994	PJM	NI_3_MSA_Chicago_L	8760	1.4	1025	12%
MISO	AMRN_12_MSA_StLouis_L	6286	PJM	NI_3_MSA_Chicago_L	8760	8.2	6210	71%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_3_MSA_Chicago_L	8760	8.0	2558	29%
MISO	ALTE_2_MSA_Madison_G	8749	PJM	NI_3_MSA_Chicago_L	8760	7.9	4795	55%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_3_MSA_Chicago_L	8760	4.5	2941	33%
MISO	AMRN_12_MSA_StLouis_L	6286	PJM	NI_6_MSA_Chicago_G	1489	9.0	6277	71%
MISO	IP_8_GEN_Clinton_G	7994	PJM	NI_6_MSA_Chicago_G	1489	2.3	462	5%
MISO	ALTE_2_MSA_Madison_G	8749	PJM	NI_6_MSA_Chicago_G	1489	8.7	4518	51%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_6_MSA_Chicago_G	1489	5.1	4033	46%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_6_MSA_Chicago_G	1489	8.9	2536	29%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_6_MSA_Chicago_G	1489	5.4	2964	34%
NYPP	NYISO_6_NYF	7512	NYPP	NYISO_10_NYJ	8760	7.5	8759	100%
NEPOOL	NEPOOL_2_NH	8425	NYPP	NYISO_10_NYJ	8760	9.8	8760	100%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_10_NYJ	8760	21.8	8760	100%
NYPP	NYISO_1_NYA	8292	NYPP	NYISO_10_NYJ	8760	20.4	8759	100%
PJM	PENELEC_2_MSA_DuBois_G	8745	NYPP	NYISO_10_NYJ	8760	19.2	5837	66%
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_10_NYJ	8760	3.0	8757	100%
NEPOOL	NEPOOL_3_ME	3787	NYPP	NYISO_10_NYJ	8760	11.2	8760	100%
NEPOOL	NEPOOL_5_SEMA	8739	NYPP	NYISO_10_NYJ	8760	6.8	8760	100%
NEPOOL	NEPOOL_7_CT	7217	NYPP	NYISO_10_NYJ	8760	7.3	8759	100%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_10_NYJ	8760	12.7	8759	100%
	IESO_6_G	8760	NYPP	NYISO_10_NYJ	8760	21.9	8760	100%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_11_NYK	8760	21.5	5838	66%
	PENELEC_2_MSA_DuBois_G	8745	NYPP	NYISO_11_NYK	8760	18.8	5838	66%
	NYISO_6_NYF	7512	NYPP	NYISO_11_NYK	8760	7.2	8760	100%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NEPOOL	NEPOOL_3_ME	3787	NYPP	NYISO_11_NYK	8760	10.8	8760	100%
NYPP	NYISO_1_NYA	8292	NYPP	NYISO_11_NYK	8760	20.1	5838	66%
NEPOOL	NEPOOL_5_SEMA	8739	NYPP	NYISO_11_NYK	8760	6.5	8760	100%
NEPOOL	NEPOOL_2_NH	8425	NYPP	NYISO_11_NYK	8760	9.4	8760	100%
NEPOOL	NEPOOL_7_CT	7217	NYPP	NYISO_11_NYK	8760	6.9	8760	100%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_11_NYK	8760	12.3	8760	100%
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_11_NYK	8760	2.6	8749	100%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_11_NYK	8760	21.5	5838	66%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_7_NYG	8404	16.2	5801	66%
NYPP	NYISO_1_NYA	8292	NYPP	NYISO_7_NYG	8404	14.7	5700	65%
NEPOOL	NEPOOL_2_NH	8425	NYPP	NYISO_7_NYG	8404	4.1	6318	72%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_7_NYG	8404	16.2	5802	66%
NEPOOL	NEPOOL_7_CT	7217	NYPP	NYISO_7_NYG	8404	1.6	5257	60%
PJM	PENELEC_2_MSA_DuBois_G	8745	NYPP	NYISO_7_NYG	8404	13.5	5769	66%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_7_NYG	8404	7.0	5475	62%
NEPOOL	NEPOOL_3_ME	3787	NYPP	NYISO_7_NYG	8404	5.5	5699	65%
NYPP	NYISO_6_NYF	7512	NYPP	NYISO_7_NYG	8404	1.8	4398	50%
NEPOOL	NEPOOL_5_SEMA	8739	NYPP	NYISO_7_NYG	8404	1.1	5429	62%
NEPOOL	NEPOOL_5_SEMA	8739	NYPP	NYISO_9_NYI	8288	5.6	8670	99%
NEPOOL	NEPOOL_7_CT	7217	NYPP	NYISO_9_NYI	8288	6.1	8599	98%
NEPOOL	NEPOOL_3_ME	3787	NYPP	NYISO_9_NYI	8288	10.0	8751	100%
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_9_NYI	8288	1.8	7125	81%
NEPOOL	NEPOOL_2_NH	8425	NYPP	NYISO_9_NYI	8288	8.5	8751	100%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_9_NYI	8288	20.6	5821	66%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_9_NYI	8288	11.4	8675	99%
NYPP	NYISO_1_NYA	8292	NYPP	NYISO_9_NYI	8288	19.2	5780	66%
NYPP	NYISO_6_NYF	7512	NYPP	NYISO_9_NYI	8288	6.3	8625	98%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_9_NYI	8288	20.6	5818	66%
PJM	PENELEC_2_MSA_DuBois_G	8745	NYPP	NYISO_9_NYI	8288	17.9	5767	66%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_9_MSA_MountPleasant_	8404	SPP	_L	8737	20.6	7126	81%
				OKGE_4_MSA_OklahomaCity				
SPP	WERE_1_MSA_Manhattan_G	8684	SPP	_L	8737	33.8	8204	93%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %	
				OKGE_4_MSA_OklahomaCity					
SPP	AEPW_5_MSA_Tulsa_G	7582	SPP	_L	8737	24.8	6318	72%	
				OKGE_4_MSA_OklahomaCity					
ENTERGY	EES_2_MSA_Batesville_G	8743	SPP	_L	8737	21.5	7906	90%	
MAPP	NPPD_4_GEN_Gentleman_G	8247	MAPP	OPPD_5_MSA_Omaha_L	8760	8.3	7482	85%	
PJM	BGE_7_MSA_Baltimore-Towson	8161	P.IM	PECO_5_MSA_Philadelphia_L	6627	7.7	4391	50%	
	Bol_r_mer_Banimere reween	0.0.		i 200_0_iiio,i_i iiiadoipiiia_2	002.		.001	0070	
PJM	PJM500_7_MSA_York-Hanover_	8760	PJM	PECO_5_MSA_Philadelphia_L	6627	8.3	1968	22%	
PJM	PJM500_4_MSA_Philadelphia_G	8645	PJM	PECO_5_MSA_Philadelphia_L	6627	8.0	0	0%	
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	PEPCO_1_MSA_DC_L	8760	13.6	7630	87%	
PJM	AP_1_County_Harrison_G	8760	PJM	PEPCO_1_MSA_DC_L	8760	13.6	7610	87%	
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	PEPCO_1_MSA_DC_L	8760	13.1	7593	86%	
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	PL_5_MSA_Lancaster_L	8760	12.5	5869	67%	
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	PL_5_MSA_Lancaster_L	8760	13.1	7248	83%	
PJM	PENELEC_2_MSA_DuBois_G	8745		PL_5_MSA_Lancaster_L	8760		7727	88%	
PJM	PENELEC_2_MSA_DuBois_G	8745		PL_7_MSA_Allentown_L	8760		7432	85%	
PJM	PJM500_9_MSA_Pittsburgh_G	8664		PL_7_MSA_Allentown_L	8760		7292	83%	
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PL_7_MSA_Allentown_L	8760	13.0	8255	94%	
NYPP	NYISO_1_NYA	8292		PSEG_3_MSA_NewYork_L	8760		8353	95%	
NYPP	NYISO_3_NYC	8760	PJM	PSEG_3_MSA_NewYork_L	8760	4.8	8262	94%	
NYPP	NYISO_1_NYA	8292	PJM	PSEG_5_MSA_Philadelphia_L	8760	13.2	8348	95%	
NYPP	NYISO_3_NYC	8760	PJM	PSEG_5_MSA_Philadelphia_L	8760	5.4	7883	90%	
NYPP	NYISO_3_NYC	8760	PJM	PSEG_8_MSA_NewYork_G	8760	4.7	8181	93%	
NYPP	NYISO_1_NYA	8292	PJM	PSEG_8_MSA_NewYork_G	8760	12.5	8148	93%	
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	VACAR	SCEG_9_MSA_Charleston_G	8571	1.2	1866	21%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCEG_9_MSA_Charleston_G	8571	1.5	1866	21%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	SCEG_9_MSA_Charleston_G	8571	1.0	1587	18%	

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	VACAR	SCEG_9_MSA_Charleston_G	8571	1.5	1853	21%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.1	853	10%	
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.6	4119	47%	
	SOCO_31_MSA_Atlanta_G	8760		SCPSA_2_MSA_Charleston_L	8760	2.3	4116	47%	
VACAR	SCPSA_10_MSA_Charleston_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.5	1282	15%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.6	4118	47%	
VACAR	DUK_9_MSA_Charlotte_G	8549	SOUTHERN	_	7847	4.0	472	5%	
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN		7847	3.2	474	5%	
SOUTHERN	SOCO_26_MSA_Macon_G	8760	SOUTHERN	_	7847	3.0	143	2%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7847	6.7	2147	24%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	SOUTHERN	SOCO_10_MSA_Albany-Valdo	7847	6.1	228	3%	
SOUTHERN	SOCO_32_MSA_Pascagoula_G	7473	SOUTHERN		7847	1.8	525	6%	
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	SOUTHERN	_	7847	3.2	146	2%	
	SOCO_28_MSA_Birmingham_G		SOUTHERN		7847	3.5	224	3%	
VACAR	SCEG_1_MSA_Columbia_G	7998	SOUTHERN	SOCO_10_MSA_Albany-Valdo	7847	1.5	354	4%	
SOUTHERN	SOCO_15_MSA_Birmingham_G	8507	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	7847	3.4	215	2%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	2.9	103	1%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	3.5	1555	18%	

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub II	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_17_MSA_Mobile_G	6866	2.8	3405	39%
T)/ALITHOD	TVA_1_MSA_Chatt-Hunts_G	0754	COLITHEDM	SOCO_17_MSA_Mobile_G	6866	2.2	3024	34%
	TVA_1_MSA_Chatt-Hunts_G			SOCO_21_MSA_Mobile_G	8716		94	34% 1%
IVAUTHOR	TVA_T_MSA_CHall-Hunts_G	0/34	SOUTHERN	SOCO_ZT_WSA_Atlanta_G	0/10	2.1	94	1 70
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_21_MSA_Atlanta_G	8716	3.3	1947	22%
T\/ALITHOP	TVA_4_MSA_Clarksville_G	8502	SUITHEDN	SOCO_33_MSA_Atlanta_L	8760	3.5	1670	19%
TVAOTTION	TVA_4_IVISA_Clarksville_G	0332	SOUTHLINI	3000_33_W3A_Atlanta_E	0700	3.5	1070	1970
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	2.9	219	2%
T) / A L IT L I O D	<b>-</b>	0754	OOLITUEDA.	0000 5 05N 05D01N 1	0700	2.0		10/
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8/54	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.0	389	4%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.7	1764	20%
				SOCO_6_MSA_Augusta-				
VACAR	DUK_9_MSA_Charlotte_G	8549	SOUTHERN	Richmond_L	8760	1.1	314	4%
				SOCO_6_MSA_Augusta-				
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	SOUTHERN		8760	3.1	83	1%
				SOCO_6_MSA_Augusta-				
	TVA_4_MSA_Clarksville_G		SOUTHERN	_	8760		1393	16%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	3.5	1651	19%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8754	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	2.9	219	2%
MISO	EKPC_8_MSA_Maysville_G			TVA_3_MSA_Knoxville_L	8760		2173	25%
MISO	LGEE_3_GEN_Gehnt2_G			TVA_3_MSA_Knoxville_L	8760		5050	57%
MISO	LGEE 3 GEN Gehnt2 G			TVA_5_MSA_Nashville_L	8646		6728	77%
MISO	EKPC_8_MSA_Maysville_G			TVA_5_MSA_Nashville_L	8646	3.3	1444	16%
ENTERGY	EES_2_MSA_Batesville_G	8743	TVAUTHOR	TVA_5_MSA_Nashville_L	8646	1.1	2464	28%
	BREC_3_County_Webster_G	8760	TVAUTHOR	TVA_5_MSA_Nashville_L	8646	11.2	7262	83%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	TVAUTHOR	TVA_5_MSA_Nashville_L	8646	5.1	2808	32%
PJM	AEP_8_GEN_Amos01_G	8760	TVAUTHOR	TVA_5_MSA_Nashville_L	8646	2.4	2876	33%
	TVA_4_MSA_Clarksville_G	8592	TVAUTHOR	TVA_5_MSA_Nashville_L	8646		0	0%
MISO	LGEE_3_GEN_Gehnt2_G	8760	TVAUTHOR	TVA_7_MSA_Memphis_L	8753	7.2	5507	63%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub I	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	AEP_8_GEN_Amos01_G	8760	TVAUTHOR	TVA_7_MSA_Memphis_L	8753	1.5	864	10%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_15_MSA_VB-Norfolk_L	8760	14.6	7929	90%
VACAR	CPLE_1_MSA_Durham_G	7930	PJM	VAP_15_MSA_VB-Norfolk_L	8760	8.0	6562	75%
PJM	AP_1_County_Harrison_G	8760		VAP_15_MSA_VB-Norfolk_L	8760	8.5	7645	87%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_15_MSA_VB-Norfolk_L	8760	8.0	7675	87%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_15_MSA_VB-Norfolk_L	8760	8.5	7705	88%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_27_MSA_DC_L	8760	18.2	7965	91%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_27_MSA_DC_L	8760	2.6	2897	33%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_27_MSA_DC_L	8760	11.6	7547	86%
PJM	VAP_7_G	6600	PJM	VAP_27_MSA_DC_L	8760	4.2	5383	61%
VACAR	CPLE_1_MSA_Durham_G	7930	PJM	VAP_27_MSA_DC_L	8760		7450	85%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_27_MSA_DC_L	8760	12.1	7573	86%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_27_MSA_DC_L	8760	12.1	7601	87%
PJM	VAP_7_G	6600	PJM	VAP_33_MSA_DC_L	8760		5401	61%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_33_MSA_DC_L	8760	2.7	3574	41%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_33_MSA_DC_L	8760	12.2	7624	87%
VACAR	CPLE_1_MSA_Durham_G	7930	PJM	VAP_33_MSA_DC_L	8760	11.7	7618	87%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_33_MSA_DC_L	8760	12.2	7707	88%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_33_MSA_DC_L	8760	18.3	8060	92%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_33_MSA_DC_L	8760	11.7	7705	88%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_7_G	2160	19.6	5807	66%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_7_G	2160	25.7	6065	69%
PJM	PJM500_5_MSA_DC_G	8760	PJM	VAP_7_G	2160	5.3	5141	59%
PJM	PJM500_4_MSA_Philadelphia_G	8645	PJM	VAP_7_G	2160	5.2	5728	65%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_7_G	2160	10.1	5479	62%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_7_G	2160	19.1	7205	82%
VACAR	CPLE_1_MSA_Durham_G	7930	PJM	VAP_7_G	2160	19.1	5410	62%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_7_G	2160	19.6	7148	81%
PJM	PJM500_7_MSA_York-Hanover_	8760	PJM	VAP_7_G	2160	5.5	6187	70%
SPP	KACP_4_MSA_KansasCity_G	7896	SPP	WERE_4_GEN_Wolfcreek_G	4506	41.9	7403	84%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	SPP	WERE_4_GEN_Wolfcreek_G	4506	11.0	7927	90%

Task 2: Appendix 5, Corridor Congestion by Scenario HighCase2011R2

Source Hub In	nformation		Sink Hub Info	rmation		Congestion I	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SPP	WERE_1_MSA_Manhattan_G	8684	SPP	WERE_4_GEN_Wolfcreek_G	4506	19.3	1483	17%
SPP	AEPW_5_MSA_Tulsa_G	7582	SPP	WERE_4_GEN_Wolfcreek_G	4506	10.3	4447	51%
MAPP	NPPD_4_GEN_Gentleman_G	8247	SPP	WERE_4_GEN_Wolfcreek_G	4506	41.3	8717	99%
MISO	OTP_9_GEN_BigStone_G	8640	MISO	XEL_3_MSA_Minneapolis_G	5869	36.1	8647	98%
MISO	ALTE_2_MSA_Madison_G	8749	MISO	XEL_3_MSA_Minneapolis_G	5869	12.6	3293	37%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	NI_2_MSA_Chicago_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8760	3.8	4673	53%
PJM	NI_6_MSA_Chicago_G	7988	PJM	AEP_1_MSA_Lynchburg_G	8760	3.6	4687	53%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8760	7.3	5854	67%
PJM	NI_15_MSA_Davenport_G	8712	PJM	AEP_1_MSA_Lynchburg_G	8760	9.5	5687	65%
PJM	NI_20_MSA_Chicago_G	7900	PJM	AEP_1_MSA_Lynchburg_G	8760	3.9	4663	53%
MISO	NIPS_8_MSA_Chicago_G	8692	PJM	AEP_1_MSA_Lynchburg_G	8760	4.0	4403	50%
MISO	IPL_2_MSA_Jasper_G	8760	PJM	AEP_1_MSA_Lynchburg_G	8760	3.3	6977	79%
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	AEP_1_MSA_Lynchburg_G	8760	9.2	7617	87%
PJM	NI_20_MSA_Chicago_G	7900	PJM	AEP_2_STA_TN-WV_L	8760	3.3	1433	16%
PJM	NI_2_MSA_Chicago_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	3.3	1350	15%
PJM	NI_6_MSA_Chicago_G	7988	PJM	AEP_2_STA_TN-WV_L	8760	3.0	1364	16%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	6.8	4048	46%
PJM	NI_15_MSA_Davenport_G	8712		AEP_2_STA_TN-WV_L	8760	9.0	3712	42%
	NIPS_8_MSA_Chicago_G	8692	PJM	AEP_2_STA_TN-WV_L	8760	3.5	1022	12%
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	AEP_2_STA_TN-WV_L	8760	8.7	6695	76%
MISO	LGEE_3_GEN_Gehnt2_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	3.0	4876	56%
MISO	IPL_2_MSA_Jasper_G	8760	PJM	AEP_2_STA_TN-WV_L	8760	2.7	6236	71%
				AEP_9_MSA_Canton-				
PJM	NI_2_MSA_Chicago_G	8760	PJM	Massillon_L	8760	3.8	1955	22%
				AEP_9_MSA_Canton-				
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	Massillon_L	8760	9.2	6851	78%
				AEP_9_MSA_Canton-				
MISO	IPL_2_MSA_Jasper_G	8760	PJM	Massillon_L	8760	3.2	6369	73%
				AEP_9_MSA_Canton-				
PJM	NI_6_MSA_Chicago_G	7988	PJM	Massillon_L	8760	3.5	1961	22%
				AEP_9_MSA_Canton-				
PJM	NI_7_MSA_Rochelle_G	8760	PJM	Massillon_L	8760	7.3	4305	49%
				AEP_9_MSA_Canton-				
PJM	NI_15_MSA_Davenport_G	8712	PJM	Massillon_L	8760	9.5	4503	51%
				AEP_9_MSA_Canton-				
PJM	NI_20_MSA_Chicago_G	7900	PJM	Massillon_L	8760	3.8	2086	24%
				AEP_9_MSA_Canton-				
MISO	NIPS_8_MSA_Chicago_G	8692		Massillon_L	8760		1193	14%
PJM	NI_20_MSA_Chicago_G	7900	MISO	AMRN_12_MSA_StLouis_L	2475	3.8	1398	16%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MAPP	MEC_3_MSA_DesMoines_G	8494	MISO	AMRN_12_MSA_StLouis_L	2475	15.9	2977	34%
PJM	NI_15_MSA_Davenport_G	8712	MISO	AMRN_12_MSA_StLouis_L	2475	9.4	3311	38%
PJM	NI_7_MSA_Rochelle_G	8760	MISO	AMRN_12_MSA_StLouis_L	2475	7.2	4187	48%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	MISO	AMRN_12_MSA_StLouis_L	2475	3.8	2207	25%
PJM	NI_6_MSA_Chicago_G	7988	MISO	AMRN_12_MSA_StLouis_L	2475	3.5	1856	21%
PJM	NI_2_MSA_Chicago_G	8760	MISO	AMRN_12_MSA_StLouis_L	2475	3.7	1832	21%
MISO	CIN_8_MSA_Evansville_G	8760	MISO	AMRN_12_MSA_StLouis_L	2475	3.1	6136	70%
MISO	IP_7_GEN_Baldwin_G	8760	MISO	AMRN_12_MSA_StLouis_L	2475	7.3	0	0%
MISO	IP_8_GEN_Clinton_G	8009	MISO	AMRN_12_MSA_StLouis_L	2475	4.5	492	6%
PJM	NI_7_MSA_Rochelle_G	8760	MISO	AMRN_2_County_Macon_L	8760	3.5	5351	61%
MISO	AMRN_12_MSA_StLouis_L	6285	MISO	AMRN_2_County_Macon_L	8760	5.5	4660	53%
PJM	NI_15_MSA_Davenport_G	8712	MISO	AMRN_2_County_Macon_L	8760	5.7	4808	55%
MISO	IP_7_GEN_Baldwin_G	8760	MISO	AMRN_2_County_Macon_L	8760	3.6	5263	60%
MAPP	MEC_3_MSA_DesMoines_G	8494	MISO	AMRN_2_County_Macon_L	8760	12.2	5064	58%
PJM	DLCO_7_MSA_Pittsburgh_G	8232		AP_2_GEN_Albright3_L	8760		4094	47%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_2_GEN_Albright3_L	8760	1.3	5794	66%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Martinsburg_L	8760	5.3	7460	85%
				AP_7_MSA_Hagerstown-				
MISO	FE_9_MSA_Weirton_G	8741	PJM	Martinsburg_L	8760	7.9	7753	88%
				AP_7_MSA_Hagerstown-				
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	Martinsburg_L	8760	7.9	7758	88%
				AP_7_MSA_Hagerstown-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Martinsburg_L	8760	5.0	7447	85%
				AP_7_MSA_Hagerstown-				
PJM	VAP_1_MSA_Richmond_G	8760	PJM	Martinsburg_L	8760	1.1	4972	57%
				AP_7_MSA_Hagerstown-				
PJM	VAP_7_G	7408	PJM	Martinsburg_L	8760	3.2	5773	66%
				AP_7_MSA_Hagerstown-				
PJM	AP_1_County_Harrison_G	8760	PJM	Martinsburg_L	8760	5.6	7492	85%
				AP_7_MSA_Hagerstown-				
PJM	AEP_8_GEN_Amos01_G	8760	PJM	Martinsburg_L	8760	8.2	7947	90%
				AP_7_MSA_Hagerstown-				
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	Martinsburg_L	8760	8.0	7778	89%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	DLCO_7_MSA_Pittsburgh_G	8232	PJM	AP_8_MSA_DC-VA-MD_L	8760	8.4	7938	90%
MISO	FE_6_MSA_Pittsburgh_G	8592	PJM	AP_8_MSA_DC-VA-MD_L	8760	8.3	7908	90%
MISO	FE_9_MSA_Weirton_G	8741	PJM	AP_8_MSA_DC-VA-MD_L	8760	8.3	7897	90%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	5.7	7701	88%
PJM	AP_1_County_Harrison_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	6.0	7665	87%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	8.6	7989	91%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	AP_8_MSA_DC-VA-MD_L	8760	5.5	7695	88%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	AP_8_MSA_DC-VA-MD_L	8760	1.5	4368	50%
PJM	VAP_7_G	7408	PJM	AP_8_MSA_DC-VA-MD_L	8760	3.6	5923	67%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Towson_L	8760	6.0	7692	88%
				BGE_10_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	6.3	7733	88%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	Towson_L	8760	5.9	7691	88%
				BGE_5_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	6.2	7736	88%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	Towson_L	8760	6.5	7747	88%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_4_MSA_Philadelphia_G	8702	PJM	Towson_L	8760	1.0	7309	83%
				BGE_9_MSA_Baltimore-				
PJM	PJM500_9_MSA_Pittsburgh_G	8664		Towson_L	8760		7715	88%
MISO	CIN_8_MSA_Evansville_G		MISO	CIN_1_MSA_Indianapolis_L	8760		3051	35%
MISO	NIPS_8_MSA_Chicago_G		MISO	CIN_1_MSA_Indianapolis_L	8760		1224	14%
MISO	IPL_2_MSA_Jasper_G		MISO	CIN_1_MSA_Indianapolis_L	8760		3135	36%
MISO	LGEE_3_GEN_Gehnt2_G	8760	MISO	CIN_1_MSA_Indianapolis_L	8760	1.5	4711	54%
MISO	AMRN_12_MSA_StLouis_L	6285	MISO	CIN_1_MSA_Indianapolis_L	8760	7.2	4567	52%
				CIN_4_MSA_Cincinnati-				
MISO	EKPC_8_MSA_Maysville_G		MISO	Middletown_G	6707	1.1	498	6%
	NIPS_8_MSA_Chicago_G	8692	MISO	CIN_7_MSA_Lafayette_L	8760		960	11%
PJM	VAP_7_G	7408	VACAR	CPLE_1_MSA_Durham_G	1223	2.2	5404	62%
VACAR	DUK_5_MSA_Seneca_G		VACAR	CPLE_1_MSA_Durham_G	1223	1.6	4432	50%
VACAR	DUK_9_MSA_Charlotte_G	8549	VACAR	CPLE_1_MSA_Durham_G	1223	4.6	600	7%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
VACAR	SCEG_1_MSA_Columbia_G	8403	VACAR	CPLE_1_MSA_Durham_G	1223	3.0	2127	24%
VACAR	SCPSA_10_MSA_Charleston_G	8760	VACAR	CPLE_1_MSA_Durham_G	1223	3.8	1892	22%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	CPLE_1_MSA_Durham_G	1223	7.2	6719	76%
VACAR	DUK_9_MSA_Charlotte_G	8549	VACAR	DUK_4_MSA_Greenville_L	7764	1.3	25	0%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	VACAR	DUK_4_MSA_Greenville_L	7764	1.6	4035	46%
	SOCO_28_MSA_Birmingham_G	8760	VACAR	DUK_4_MSA_Greenville_L	7764	1.7	4013	46%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	VACAR	DUK_4_MSA_Greenville_L	7764	1.0	1051	12%
	SOCO_32_MSA_Pascagoula_G		VACAR	DUK_4_MSA_Greenville_L	7764		4119	47%
	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_4_MSA_Greenville_L	7764	3.9	5013	57%
	AEP_8_GEN_Amos01_G		VACAR	DUK_8_MSA_Charlotte_L	8760	3.1	3953	45%
PJM	AEP_8_GEN_Amos01_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	19.9	4230	48%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	VACAR	DUK_9_MSA_Charlotte_G	211	17.5	2412	27%
	CPLE_1_MSA_Durham_G	7537	VACAR	DUK_9_MSA_Charlotte_G	211	16.5	230	3%
VACAR	DUK_5_MSA_Seneca_G	7069	VACAR	DUK_9_MSA_Charlotte_G	211	14.3	16	0%
VACAR	SCEG_1_MSA_Columbia_G	8403	VACAR	DUK_9_MSA_Charlotte_G	211	15.7	226	3%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	VACAR	DUK_9_MSA_Charlotte_G	211	17.6	2472	28%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	16.9	752	9%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	17.6	2546	29%
	SOCO_31_MSA_Atlanta_G	8760	VACAR	DUK_9_MSA_Charlotte_G	211	17.0	1243	14%
ENTERGY	EES_9_MSA_Russellville_G	3149	ENTERGY	EES_1_MSA_Jackson_L	8760	5.2	2669	30%
	AEPW_5_MSA_Tulsa_G	7180	ENTERGY	EES_1_MSA_Jackson_L	8760		2806	32%
SPP	AEPW_9_MSA_MountPleasant_	7212	ENTERGY	EES_1_MSA_Jackson_L	8760	2.2	8706	99%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.3	6911	79%
SPP	AEPW_5_MSA_Tulsa_G	7180	ENTERGY	EES_5_MSA_NewOrleans_G	8760	11.1	7060	80%
ENTERGY	EES_7_MSA_Beaumont-PortArth	2674	ENTERGY	EES_5_MSA_NewOrleans_G	8760	2.0	6655	76%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	2.8	7109	81%
SPP	CELE_10_MSA_Alexandria_G	8344	ENTERGY	EES_5_MSA_NewOrleans_G	8760	4.0	6855	78%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	2.7	7124	81%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ENTERGY	EES_8_MSA_BatonRouge_G	8496	ENTERGY	EES_5_MSA_NewOrleans_G	8760	5.8	5468	62%
ENTERGY	EES_4_GEN_Ouachita_G	6307	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.9	6656	76%
		0.1.10	- N - T - D - O \ /			40.0		2001
ENTERGY	EES_9_MSA_Russellville_G	3149	ENTERGY	EES_5_MSA_NewOrleans_G	8760	10.9	7036	80%
ENTEROY	550 40 MOA Walata a O	0004	ENITED OV	EEO E MOA NE Odere O	0700	- 4	0004	700/
ENTERGY	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_5_MSA_NewOrleans_G	8760	5.1	6691	76%
ENTERGY	LACN 1 MCA BetenBourge C	9760	ENTERGY	EES_5_MSA_NewOrleans_G	8760	5.7	6651	760/
ENTERGI	LAGN_1_MSA_BatonRouge_G	0700	ENTERGI	EES_5_WSA_NewOrleans_G	0700	5.7	0001	76%
SOLITHERN	SOCO_15_MSA_Birmingham_G	8553	ENTERGY	EES_5_MSA_NewOrleans_G	8760	3.4	7091	81%
SOUTHLINI	3000_13_W3A_Billilligham_9	0000	LIVILIOI	LLO_5_WOA_NewOrleans_O	0700	5.4	7091	0170
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	ENTERGY	EES 5 MSA NewOrleans G	8760	3.5	7085	81%
	AEPW_9_MSA_MountPleasant_			EES_5_MSA_NewOrleans_G	8760	7.9	8709	99%
0	7.E. VI_O_MO/ _Mount reacant_	,,,,		EES_7_MSA_Beaumont-	0.00	7.10	0.00	0070
ENTERGY	EES_9_MSA_Russellville_G	3149		PortArthur G	6086	5.8	6993	80%
	AEPW 9 MSA MountPleasant			EES 7 MSA Beaumont-PortA	6086	2.8	8707	99%
				EES_7_MSA_Beaumont-				
SPP	AEPW_5_MSA_Tulsa_G	7180		PortArthur_G	6086	6.0	4079	46%
	TVA_4_MSA_Clarksville_G	8592	ENTERGY	EES_9_MSA_Russellville_G	5611	2.2	2181	25%
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	ENTERGY	EES_9_MSA_Russellville_G	5611	2.1	1112	13%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	ENTERGY	EES_9_MSA_Russellville_G	5611	1.0	0	0%
ENTERGY	LAGN_1_MSA_BatonRouge_G	8760	ENTERGY	EES_9_MSA_Russellville_G	5611	1.7	0	0%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	ENTERGY	EES_9_MSA_Russellville_G	5611	5.1	2816	32%
	EES_2_MSA_Batesville_G	8743	ENTERGY	EES_9_MSA_Russellville_G	5611	2.8	1775	20%
SPP	AEPW_9_MSA_MountPleasant_			EES_9_MSA_Russellville_G	5611	3.8	8707	99%
SPP	AEPW_5_MSA_Tulsa_G			EES_9_MSA_Russellville_G	5611	7.0	280	3%
PJM	AEP_8_GEN_Amos01_G		MISO	FE_5_MSA_Cleveland_L	8355	1.1	4706	54%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	3.7	4002	46%
	SOCO_15_MSA_Birmingham_G		FRCC	FPC_3_MSA_Orlando_L	8760		4006	46%
	SOCO_32_MSA_Pascagoula_G		FRCC	FPC_3_MSA_Orlando_L	8760		4183	48%
	SOCO_31_MSA_Atlanta_G		FRCC	FPC_3_MSA_Orlando_L	8760		4017	46%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_3_MSA_Orlando_L	8760	4.4	4010	46%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	rmation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	FRCC	FPC_4_MSA_Tampa_L	8760	4.8	4487	51%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	4.2	4350	50%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	4.9	4354	50%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	FRCC	FPC_4_MSA_Tampa_L	8760	4.9	4353	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPC_4_MSA_Tampa_L	8760	4.3	4352	50%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_2_MSA_FortMyers_G	8680	1.2	5035	57%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	FRCC	FPL_2_MSA_FortMyers_G	8680	5.4	4773	54%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8680	4.8	4764	54%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8680	4.8	4769	54%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_2_MSA_FortMyers_G	8680	5.5	4774	54%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	FRCC	FPL_2_MSA_FortMyers_G	8680	5.3	4890	56%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_3_MSA_Miami_L	8760	1.5	5120	58%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	5.8	4680	53%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	FRCC	FPL_3_MSA_Miami_L	8760	5.7	4680	53%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	5.1	4671	53%
FRCC	SEC_6_MSA_Palatka_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	1.0	4854	55%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	FRCC	FPL_3_MSA_Miami_L	8760	5.6	4791	55%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_3_MSA_Miami_L	8760	5.1	4673	53%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	FRCC	FPL_7_MSA_Miami_L	8760	5.6	4820	55%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	5.0	4707	54%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	5.7	4716	54%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	FRCC	FPL_7_MSA_Miami_L	8760	5.1	4710	54%
FRCC	FPC_2_MSA_HomosassaSpring	8544	FRCC	FPL_7_MSA_Miami_L	8760	1.5	5182	59%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	FRCC	FPL_7_MSA_Miami_L	8760	5.7	4714	54%
	XEL_3_MSA_Minneapolis_G	2949	MISO	GRE_4_MSA_Minneapolis_L	8760	10.4	6	0%
MISO	ITC_7_MSA_Monroe_G	8472	ONTARIO	IESO_11_G	8760	1.7	5943	68%
NYPP	NYISO_4_NYD	7592	ONTARIO	IESO_11_G	8760	16.0	8087	92%
MISO	ITC_3_MSA_Detroit_G	8744	ONTARIO	IESO_11_G	8760	1.3	7608	87%
NYPP	NYISO_4_NYD	7592	ONTARIO	IESO_15_G	8760	15.8	8087	92%
MISO	ITC_3_MSA_Detroit_G	8744	ONTARIO	IESO_15_G	8760	1.2	7005	80%
MISO	ITC_7_MSA_Monroe_G			IESO_15_G	8760	1.6	5771	66%
NYPP	NYISO_4_NYD			IESO_2_G	6738	14.4	8222	94%
NYPP	NYISO_4_NYD	7592		IESO_3_L	8760	15.2	8090	92%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.4	2888	33%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub In	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_5_MSA_Indianapolis_L	8760	1.3	6004	68%
MISO	IPL_2_MSA_Jasper_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	1.4	2944	34%
MISO	CIN_8_MSA_Evansville_G	8760	MISO	IPL_8_MSA_Indianapolis_L	8760	1.3	6099	69%
SPP	WERE_1_MSA_Manhattan_G	8145	SPP	KACP_7_MSA_KansasCity_L	8760	3.5	893	10%
MISO	WEC_1_MSA_Chicago_G	8592	MISO	METC_8_MSA_BayCity_G	8013	6.5	5238	60%
MISO	WEC_1_MSA_Chicago_G			METC_9_MSA_Kalamazoo_L	8760	6.1	4717	54%
NYPP	NYISO_1_NYA			NEPOOL_10_RI	6733	4.5	6038	69%
NYPP	NYISO_3_NYC			NEPOOL_10_RI	6733	2.0	8758	100%
NEPOOL	NEPOOL_3_ME	3832	NEPOOL	NEPOOL_10_RI	6733	2.8	6752	77%
NYPP	NYISO_4_NYD	7592	NEPOOL	NEPOOL_10_RI	6733	20.9	8757	100%
NYPP	NYISO_4_NYD	7592	NEPOOL	NEPOOL_3_ME	4928	15.6	8605	98%
NEPOOL	NEPOOL_2_NH	8300	NEPOOL	NEPOOL_4_NEBOS	8717	1.4	6761	77%
NYPP	NYISO_4_NYD	7592	NEPOOL	NEPOOL_4_NEBOS	8717	21.3	8611	98%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_4_NEBOS	8717	2.4	8758	100%
NYPP	NYISO_1_NYA	8298	NEPOOL	NEPOOL_4_NEBOS	8717	4.9	6038	69%
NEPOOL	NEPOOL_3_ME	3832	NEPOOL	NEPOOL_4_NEBOS	8717	3.2	6769	77%
NEPOOL	NEPOOL_2_NH	8300	NEPOOL	NEPOOL_6_WCMA	8556	1.5	6912	79%
NEPOOL	NEPOOL_3_ME	3832	NEPOOL	NEPOOL_6_WCMA	8556	3.3	6900	79%
NYPP	NYISO_4_NYD	7592	NEPOOL	NEPOOL_6_WCMA	8556	21.4	8611	98%
NYPP	NYISO 3 NYC	8760	NEPOOL	NEPOOL_6_WCMA	8556	2.5	8578	98%
NYPP	NYISO_1_NYA	8298	NEPOOL	NEPOOL_6_WCMA	8556	5.0	6043	69%
NEPOOL	NEPOOL_2_NH	8300	NEPOOL	NEPOOL_7_CT	1734	4.4	7608	87%
NYPP	NYISO_4_NYD	7592	NEPOOL	NEPOOL_7_CT	1734	24.3	8759	100%
NYPP	NYISO_6_NYF	7760	NEPOOL	NEPOOL_7_CT	1734	3.7	8756	100%
NYPP	NYISO_1_NYA	8298	NEPOOL	NEPOOL_7_CT	1734	7.9	6043	69%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_7_CT	1734	5.4	8758	100%
NEPOOL	NEPOOL_5_SEMA	8757	NEPOOL	NEPOOL_7_CT	1734	3.0	2790	32%
NEPOOL	NEPOOL_3_ME		NEPOOL	NEPOOL_7_CT	1734	6.2	7583	86%
NYPP	NYISO_8_NYH		NEPOOL	NEPOOL_7_CT	1734	1.3	8754	100%
NYPP	NYISO_6_NYF		NEPOOL	NEPOOL_9_NWKST	8760	2.0	8760	100%
NEPOOL	NEPOOL_5_SEMA		NEPOOL	NEPOOL_9_NWKST	8760	1.2	8759	100%
NYPP	NYISO 4 NYD	7592	NEPOOL	NEPOOL_9_NWKST	8760	22.5	8760	100%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NEPOOL	NEPOOL_3_ME	3832	NEPOOL	NEPOOL_9_NWKST	8760	4.4	8758	100%
NYPP	NYISO_1_NYA	8298	NEPOOL	NEPOOL_9_NWKST	8760	6.1	6047	69%
NEPOOL	NEPOOL_2_NH	8300	NEPOOL	NEPOOL_9_NWKST	8760	2.6	8759	100%
NYPP	NYISO_3_NYC	8760	NEPOOL	NEPOOL_9_NWKST	8760	3.6	8760	100%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_13_MSA_Chicago_L	8760	5.6	3352	38%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_13_MSA_Chicago_L	8760	3.4	3339	38%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_13_MSA_Chicago_L	8760	2.0	4176	48%
MISO	ALTE_2_MSA_Madison_G	8746	PJM	NI_13_MSA_Chicago_L	8760	5.6	5204	59%
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	NI_13_MSA_Chicago_L	8760	5.3	6674	76%
MISO	ALTE_2_MSA_Madison_G	8746	PJM	NI_3_MSA_Chicago_L	8760	5.5	5204	59%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_3_MSA_Chicago_L	8760	1.9	3825	44%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_3_MSA_Chicago_L	8760	5.5	3369	38%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_3_MSA_Chicago_L	8760	3.3	3369	38%
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	NI_3_MSA_Chicago_L	8760	5.2	6630	75%
PJM	NI_15_MSA_Davenport_G	8712	PJM	NI_6_MSA_Chicago_G	772	4.8	3363	38%
PJM	NI_7_MSA_Rochelle_G	8760	PJM	NI_6_MSA_Chicago_G	772	2.7	3402	39%
MISO	AMRN_12_MSA_StLouis_L	6285	PJM	NI_6_MSA_Chicago_G	772	4.6	6668	76%
MISO	WEC_1_MSA_Chicago_G	8592	PJM	NI_6_MSA_Chicago_G	772	1.2	4173	48%
MISO	ALTE_2_MSA_Madison_G	8746	PJM	NI_6_MSA_Chicago_G	772	4.8	4782	54%
NYPP	NYISO_4_NYD	7592	NYPP	NYISO_1_NYA	462	11.2	8081	92%
	NYISO_4_NYD	7592	NYPP	NYISO_10_NYJ	8760	24.1	8759	100%
NEPOOL	NEPOOL_7_CT	7026	NYPP	NYISO_10_NYJ	8760	2.5	8759	100%
NEPOOL	NEPOOL_3_ME	3832	NYPP	NYISO_10_NYJ	8760	6.0	8760	100%
	NEPOOL_2_NH	8300	NYPP	NYISO_10_NYJ	8760	4.2	8760	100%
NYPP	NYISO_8_NYH	8760	NYPP	NYISO_10_NYJ	8760	1.2	8758	100%
NEPOOL	NEPOOL_5_SEMA	8757	NYPP	NYISO_10_NYJ	8760	2.8	8760	100%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_10_NYJ	8760	8.4	8760	100%
NYPP	NYISO_1_NYA	8298	NYPP	NYISO_10_NYJ	8760	7.8	8759	100%
ONTARIO	IESO_7_G	8760	NYPP	NYISO_10_NYJ	8760	8.4	8759	100%
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_10_NYJ	8760	5.2	8760	100%
PJM	PENELEC_2_MSA_DuBois_G	8368	NYPP	NYISO_10_NYJ	8760	6.5	6039	69%
	IESO_2_G		NYPP	NYISO_10_NYJ	8760	4.0	8760	100%
NYPP	NYISO_6_NYF		NYPP	NYISO_10_NYJ	8760		8760	100%
NEPOOL	NEPOOL_5_SEMA	8757	NYPP	NYISO_11_NYK	8760	3.4	8760	100%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_3_NYC	8760	NYPP	NYISO_11_NYK	8760	5.8	8760	100%
NEPOOL	NEPOOL_3_ME	3832	NYPP	NYISO_11_NYK	8760	6.6	8760	100%
	IESO_2_G		NYPP	NYISO_11_NYK	8760	4.5	6040	69%
	NYISO_4_NYD		NYPP	NYISO_11_NYK	8760	24.7	8760	100%
	NEPOOL_7_CT		NYPP	NYISO_11_NYK	8760		8760	100%
	NYISO_8_NYH		NYPP	NYISO_11_NYK	8760		8756	100%
	NEPOOL_2_NH		NYPP	NYISO_11_NYK	8760		8760	100%
	NYISO_1_NYA		NYPP	NYISO_11_NYK	8760		6040	69%
	PENELEC_2_MSA_DuBois_G		NYPP	NYISO_11_NYK	8760		6040	69%
ONTARIO	IESO_7_G		NYPP	NYISO_11_NYK	8760		6040	69%
	NYISO_6_NYF		NYPP	NYISO_11_NYK	8760		8760	100%
	IESO_6_G		NYPP	NYISO_11_NYK	8760		6040	69%
	NYISO_4_NYD		NYPP	NYISO_2_NYB	8760		7958	91%
	NYISO_4_NYD		NYPP	NYISO_6_NYF	1000		8632	98%
	NEPOOL_3_ME		NYPP	NYISO_7_NYG	8191	3.4	5819	66%
	PENELEC_2_MSA_DuBois_G		NYPP	NYISO_7_NYG	8191	3.8	5983	68%
	NEPOOL_2_NH		NYPP	NYISO_7_NYG	8191	1.6	6368	72%
	NYISO_3_NYC		NYPP	NYISO_7_NYG	8191	2.6	5530	63%
	NYISO_4_NYD		NYPP	NYISO_7_NYG	8191	21.5	5757	66%
	NYISO_1_NYA		NYPP	NYISO_7_NYG	8191	5.1	5925	67%
	IESO_7_G		NYPP	NYISO_7_NYG	8191	5.8	6005	68%
	IESO_2_G		NYPP	NYISO_7_NYG	8191	1.3	6017	68%
	IESO_6_G		NYPP	NYISO_7_NYG	8191	5.8	6005	68%
	NYISO_1_NYA		NYPP	NYISO_9_NYI	8288		5996	68%
	NYISO_4_NYD		NYPP	NYISO_9_NYI	8288	23.6	8733	99%
	NYISO_6_NYF		NYPP	NYISO_9_NYI	8288		8596	98%
	NEPOOL_2_NH		NYPP	NYISO_9_NYI	8288		8731	99%
	NYISO_3_NYC	8760	NYPP	NYISO_9_NYI	8288	4.7	8671	99%
NEPOOL	NEPOOL_5_SEMA	8757	NYPP	NYISO_9_NYI	8288	2.3	8602	98%
PJM	PENELEC_2_MSA_DuBois_G		NYPP	NYISO_9_NYI	8288		5987	68%
NEPOOL	NEPOOL_7_CT	7026	NYPP	NYISO_9_NYI	8288	2.0	8512	97%
NEPOOL	NEPOOL_3_ME	3832	NYPP	NYISO_9_NYI	8288	5.5	8730	99%
ONTARIO	IESO_7_G		NYPP	NYISO_9_NYI	8288	7.9	6021	69%
ONTARIO	IESO_6_G	8760	NYPP	NYISO_9_NYI	8288	7.9	6021	69%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
ONTARIO	IESO_2_G	2022	NYPP	NYISO_9_NYI	8288	3.4	6022	69%
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_9_MSA_Russellville_G	3149	SPP	_L	8719	14.9	7130	81%
				OKGE_4_MSA_OklahomaCity				
ENTERGY	EES_2_MSA_Batesville_G	8743	SPP	_L	8719	10.8	7579	86%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_5_MSA_Tulsa_G	7180	SPP	_L	8719	15.0	6322	72%
				OKGE_4_MSA_OklahomaCity				
SPP	WERE_1_MSA_Manhattan_G	8145	SPP	_L	8719	16.5	8397	96%
				OKGE_4_MSA_OklahomaCity				
SPP	AEPW_9_MSA_MountPleasant_		SPP	_L	8719		6538	74%
MAPP	NPPD_4_GEN_Gentleman_G	8235	MAPP	OPPD_5_MSA_Omaha_L	8760	6.1	7769	88%
PJM	PJM500_7_MSA_York-Hanover_	8760	PJM	PECO_5_MSA_Philadelphia_L	7264	2.1	977	11%
PJM	PJM500_4_MSA_Philadelphia_G	8702		PECO_5_MSA_Philadelphia_L	7264	2.3	0	0%
PJM	AP_1_County_Harrison_G	8760		PEPCO_1_MSA_DC_L	8760		7511	86%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PEPCO_1_MSA_DC_L	8760		7514	86%
PJM	PJM500_9_MSA_Pittsburgh_G		PJM	PEPCO_1_MSA_DC_L	8760		7503	85%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		PL_5_MSA_Lancaster_L	8760		7044	80%
PJM	PJM500_9_MSA_Pittsburgh_G		PJM	PL_5_MSA_Lancaster_L	8760	5.0	5819	66%
PJM	PENELEC_2_MSA_DuBois_G	8368		PL_5_MSA_Lancaster_L	8760	4.3	7397	84%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	PL_7_MSA_Allentown_L	8760	5.1	8234	94%
PJM	PENELEC_2_MSA_DuBois_G	8368		PL_7_MSA_Allentown_L	8760	4.1	7335	84%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	PL_7_MSA_Allentown_L	8760	4.8	7379	84%
NYPP	NYISO_3_NYC		PJM	PSEG_3_MSA_NewYork_L	8760	3.2	8194	93%
NYPP	NYISO_4_NYD	7592	PJM	PSEG_3_MSA_NewYork_L	8760	22.1	8338	95%
NYPP	NYISO_1_NYA	8298	PJM	PSEG_3_MSA_NewYork_L	8760	5.7	8174	93%
NYPP	NYISO_6_NYF	7760	PJM	PSEG_3_MSA_NewYork_L	8760	1.5	8206	93%
NYPP	NYISO_4_NYD	7592	PJM	PSEG_5_MSA_Philadelphia_L	8760	22.4	8330	95%
NYPP	NYISO_3_NYC	8760	PJM	PSEG_5_MSA_Philadelphia_L	8760	3.5	7891	90%
NYPP	NYISO_1_NYA	8298	PJM	PSEG_5_MSA_Philadelphia_L	8760	6.0	8152	93%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
NYPP	NYISO_6_NYF	7760		PSEG_5_MSA_Philadelphia_L	8760		8260	94%
NYPP	NYISO_6_NYF	7760		PSEG_8_MSA_NewYork_G	8758		8051	92%
NYPP	NYISO_4_NYD	7592		PSEG_8_MSA_NewYork_G	8758		8372	95%
NYPP	NYISO_3_NYC	8760		PSEG_8_MSA_NewYork_G	8758		8087	92%
NYPP	NYISO_1_NYA	8298		PSEG_8_MSA_NewYork_G	8758		8110	92%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	VACAR	SCEG_9_MSA_Charleston_G	8736	1.4	2293	26%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	VACAR	SCEG_9_MSA_Charleston_G	8736	1.3	2502	28%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCEG_9_MSA_Charleston_G	8736	1.5	2313	26%
VACAR	SCPSA_10_MSA_Charleston_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.5	1827	21%
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.6	4390	50%
SOUTHERN	SOCO_26_MSA_Macon_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.0	1156	13%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.7	4387	50%
SOUTHERN	SOCO_31_MSA_Atlanta_G	8760	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.1	4423	50%
VACAR	CPLE_1_MSA_Durham_G	7537	VACAR	SCPSA_2_MSA_Charleston_L	8760	1.5	2299	26%
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	VACAR	SCPSA_2_MSA_Charleston_L	8760	2.5	4755	54%
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN		8122	4.4	2388	27%
VACAR	DUK_9_MSA_Charlotte_G	8549	SOUTHERN		8122	1.2	596	7%
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	9.1	3200	36%
SOUTHERN	SOCO_28_MSA_Birmingham_G	8760	SOUTHERN	SOCO_10_MSA_Albany- Valdosta_L	8122	1.6	526	6%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area		Hours	Differential	Hours	U90 %
				SOCO_10_MSA_Albany-				
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	_	8122	2.0	1249	14%
				SOCO_10_MSA_Albany-				
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	Valdosta_L	8122	3.2	947	11%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_15_MSA_Birmingham_G	8553	SOUTHERN	_	8122	1.5	511	6%
				SOCO_10_MSA_Albany-				
SOUTHERN	SOCO_32_MSA_Pascagoula_G	8204	SOUTHERN		8122	1.4	827	9%
				SOCO_10_MSA_Albany-				
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	Valdosta_L	8122	4.3	530	6%
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	1.2	1039	12%
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	8.2	3082	35%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	2.4	605	7%
T. (ALITH 100								
IVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	3.5	1564	18%
T) / A LITILIOD	T. /	0750	OOLITHEDN	0000 40 MOA Alleste I	0700	0.4	407	00/
IVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8/56	SOUTHERN	SOCO_16_MSA_Atlanta_L	8760	3.4	197	2%
TVALITUOD	TVA A MOA Obala III. O	0500	COLITILEDA	COCO 47 MCA Makila C	7000	4.0	0040	0.40/
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	1.9	3018	34%
TVALITUOD	T) / A	0750	COLITUEDA	COCO 47 MCA Makila C	7000	4.0	0000	220/
IVAUTHUR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	1.8	2890	33%
ENTERCY	EES O MSA Bussallvilla C	2140	COLITHEDA	SOCO 17 MSA Mobile C	7020	6.6	21.11	260/
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_17_MSA_Mobile_G	7920	0.0	3141	36%
TVALITHOR	TVA 1 MSA Chatt Hunta C	0756	COLITHEDA	SOCO_21_MSA_Atlanta_G	8631	3.1	207	2%
IVAUINOR	TVA_1_MSA_Chatt-Hunts_G	0730	SOUTHERN	SOCO_21_WSA_Atlanta_G	0031	3.1	207	2%
TVALITHOD	TVA 4 MSA Clarkovilla C	0500	SUITHEDM	SOCO 21 MSA Atlanta C	8631	3.2	1961	220/
IVAUITOR	TVA_4_MSA_Clarksville_G	0092	SOUTHERN	SOCO_21_MSA_Atlanta_G	0031	3.2	1901	22%
ENTERGY	EES_10_MSA_Vicksburg_G	9064	SUITHEDM	SOCO_21_MSA_Atlanta_G	8631	2.1	595	7%
LIVIENGI	LLO_10_WOA_VICKSDUIY_G	0004	SOUTHERN	JOCO_ZT_WISA_Atlanta_G	0031	۷.۱	595	1 70
ENTERGY	EES_9_MSA_Russellville_G	31/10	SOLITHERN	SOCO_21_MSA_Atlanta_G	8631	7.9	3045	35%
LIVILINGI	LLO_9_INIOA_INUSSEIIVIIIE_G	3149	SOUTHLAN	OCCO_Z I_WOA_Allanta_G	0031	7.9	3043	35%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion Indicators			
		Source			Sink	Price	U90		
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %	
	EES_9_MSA_Russellville_G			SOCO_33_MSA_Atlanta_L	8760		3305	38%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3.5	613	7%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	3.6	1976	22%	
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	2.4	1061	12%	
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	SOCO_33_MSA_Atlanta_L	8760	1.2	1365	16%	
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	2.6	987	11%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.7	1853	21%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	3.6	593	7%	
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	8.4	3233	37%	
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	SOCO_5_GEN_GEPCHY_L	8760	1.4	1890	22%	
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	SOCO_6_MSA_Augusta-Richm	8760	3.4	134	2%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN		8760	3.5	1297	15%	
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN		8760	2.4	529	6%	
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	_	8760	1.2	1632	19%	
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_6_MSA_Augusta- Richmond_L	8760	8.2	2847	32%	
ENTERGY	EES_9_MSA_Russellville_G	3149	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	8.3	3298	38%	
ENTERGY	EES_4_GEN_Ouachita_G	6307	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	1.2	1377	16%	
TVAUTHOR	TVA_4_MSA_Clarksville_G	8592	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	3.6	1934	22%	

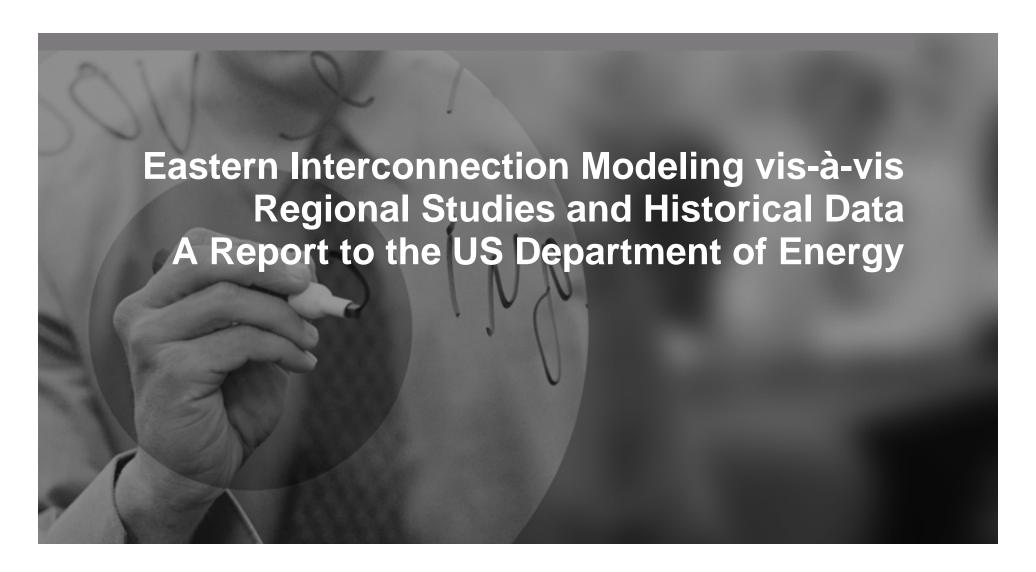
Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub Ir	nformation		Sink Hub Info	ormation		Congestion I	ndicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
TVAUTHOR	TVA_1_MSA_Chatt-Hunts_G	8756	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	3.5	603	7%
ENTERGY	EES_10_MSA_Vicksburg_G	8064	SOUTHERN	SOCO_8_MSA_Atlanta_L	8760	2.4	1062	12%
	EES_9_MSA_Russellville_G			TVA_3_MSA_Knoxville_L	8760		2967	34%
	LGEE 3 GEN Gehnt2 G			TVA 5 MSA Nashville L	8689		5473	62%
	BREC_3_County_Webster_G			TVA_5_MSA_Nashville_L	8689		6069	69%
	AECI_4_GEN_NewMadrid1_G			TVA 5 MSA Nashville L	8689		2455	28%
	EES 9 MSA Russellville G			TVA 5 MSA Nashville L	8689		2889	33%
	EES_9_MSA_Russellville_G			TVA_7_MSA_Memphis_L	8714		1044	12%
	LGEE 3 GEN Gehnt2 G			TVA 7 MSA Memphis L	8714		4945	56%
PJM	PJM500_3_MSA_Pittsburgh_G	8760		VAP_15_MSA_VB-Norfolk_L	8760		7585	86%
PJM	VAP 7 G	7408		VAP 15 MSA VB-Norfolk L	8760		5870	67%
VACAR	CPLE_1_MSA_Durham_G	7537		VAP_15_MSA_VB-Norfolk_L	8760		6460	74%
	PJM500 9 MSA Pittsburgh G	8664		VAP 15 MSA VB-Norfolk L	8760		7557	86%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP 15 MSA VB-Norfolk L	8760	6.7	7842	89%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_15_MSA_VB-Norfolk_L	8760	4.1	7391	84%
PJM	PJM500 3 MSA Pittsburgh G	8760	PJM	VAP_27_MSA_DC_L	8760	5.3	7569	86%
PJM	VAP 7 G	7408	PJM	VAP 27 MSA DC L	8760	3.2	5847	67%
PJM	VAP 1 MSA Richmond G	8760	PJM	VAP_27_MSA_DC_L	8760	1.1	3375	38%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_27_MSA_DC_L	8760	8.1	7841	89%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_27_MSA_DC_L	8760	5.5	7564	86%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_27_MSA_DC_L	8760	5.0	7472	85%
VACAR	CPLE_1_MSA_Durham_G	7537	PJM	VAP_27_MSA_DC_L	8760	4.7	7349	84%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_33_MSA_DC_L	8760	5.3	7646	87%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_33_MSA_DC_L	8760	1.1	4125	47%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_33_MSA_DC_L	8760	5.0	7643	87%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_33_MSA_DC_L	8760	8.1	8041	92%
VACAR	CPLE_1_MSA_Durham_G	7537	PJM	VAP_33_MSA_DC_L	8760	4.7	7567	86%
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_33_MSA_DC_L	8760	5.5	7609	87%
PJM	VAP_7_G	7408	PJM	VAP_33_MSA_DC_L	8760	3.2	5853	67%
PJM	PJM500_3_MSA_Pittsburgh_G	8760	PJM	VAP_7_G	1352		7063	80%
PJM	PJM500_4_MSA_Philadelphia_G	8702		VAP_7_G	1352		5628	64%
VACAR	CPLE_1_MSA_Durham_G	7537	PJM	VAP_7_G	1352	14.9	5361	61%

Task 2: Appendix 5, Corridor Congestion by Scenario LowCase2011R2

Source Hub II	nformation		Sink Hub Info	ormation		Congestion	Indicators	
		Source			Sink	Price	U90	
Market Area	Hub Name	Hours	Market Area	Hub Name	Hours	Differential	Hours	U90 %
PJM	AP_1_County_Harrison_G	8760	PJM	VAP_7_G	1352	15.7	5584	64%
PJM	AEP_8_GEN_Amos01_G	8760	PJM	VAP_7_G	1352	18.3	6164	70%
PJM	PJM500_9_MSA_Pittsburgh_G	8664	PJM	VAP_7_G	1352	15.1	7062	80%
PJM	PJM500_7_MSA_York-Hanover_	8760	PJM	VAP_7_G	1352	9.8	5770	66%
PJM	PJM500_5_MSA_DC_G	8760	PJM	VAP_7_G	1352	9.0	4867	55%
PJM	VAP_1_MSA_Richmond_G	8760	PJM	VAP_7_G	1352	11.2	5715	65%
MAPP	NPPD_4_GEN_Gentleman_G	8235	SPP	WERE_4_GEN_Wolfcreek_G	4445	25.4	8757	100%
ENTERGY	AECI_4_GEN_NewMadrid1_G	8760	SPP	WERE_4_GEN_Wolfcreek_G	4445	6.4	7749	88%
SPP	AEPW_5_MSA_Tulsa_G	7180	SPP	WERE_4_GEN_Wolfcreek_G	4445	8.4	3204	36%
SPP	WERE_1_MSA_Manhattan_G	8145	SPP	WERE_4_GEN_Wolfcreek_G	4445	9.9	807	9%
	KACP_4_MSA_KansasCity_G		SPP	WERE_4_GEN_Wolfcreek_G	4445		7380	84%
MISO	OTP_9_GEN_BigStone_G		MISO	XEL_3_MSA_Minneapolis_G	5811	21.8	8645	98%
MISO	ALTE_2_MSA_Madison_G	8746	MISO	XEL_3_MSA_Minneapolis_G	5811	6.0	2393	27%

# Task 4





DOE Congestion Study: Task 4 April 28, 2006

## **Task 4 Project Team**

#### **CRA International**

- Alex Rudkevich
- Minghai Liu
- Ira Shavel
- Ken Ditzel



#### Task 4 Objectives

- Assess the results of the review of regional transmission studies and data obtained at Task 1 against modeling results obtained at Task 2
- Identify whether modeling results are consistent with industry studies and observations and if not, find major reasons why not
- Identify major corridors most affected by major congested constraints
- Identify whether there are other problems identified in the modeling (Task 2) and not identified in regional studies
- Determine major transmission corridors influenced by these transmission problems



## Methodology

- First we identified all known constrained areas for which modeling results show no or little congestion and investigated key reasons behind this outcome, e.g.:
  - Recent or planned before 2008 transmission upgrades which could relieve these constraints
  - Similarly located (parallel, upstream or downstream) known constraints bind and prevent other constraints from binding
  - Similarly located (parallel, upstream or downstream) and "unknown" constraints bind and prevent other constraints from binding
- Next, as we found several "unknown" constraints with very large number of binding hours and congestion costs, we contacted regional transmission coordinators to verify whether the constraint is properly defined and whether there exist special protection schemes around these constraints
- In conducting this investigation, we have performed several iterations of excluding or modifying constraints, primarily in MISO, from modeling analysis and re-running the model until all concerns have been addressed
- The comparison of the results of Tasks 1 and 2 are summarized in Table 2 presented in Appendix 4-1 (attached)



#### Table 2 in Appendix 4-1 explained

- Constrained area: same is in Table 1 per Task 1
- Constraint name as modeled: abbreviations for relevant constraints representing the constrained area as used in the Task 2 model
- <u>U90 hours</u>: number of hours this constraint is loaded at the level at or above 90% of its capacity in the 2008 Base Case simulation scenario
- Constraint rankings are based on the 2008 Base Case simulation scenario. All indicators except U90
  are meaningful only for constraints that bind. For non-binding constraints ranks in corresponding
  cell in the table appear blank
- Corridors that are most impacted by constraint: as discussed in the Task 2 report, a corridor analysis
  identifies constraints that are first, second and third most limiting for an incremental power transfer
  from source to sink nodes of the corridor. The results of this analysis are compiled in the database.
  For a given constraint, this database is queried to determine which corridors are most affected by
  that constraint
- Constraints that are most limiting the corridor: when most affected corridors are identified, the same
  database is queried for the second time to determine which constraints are the most limiting for that
  corridor. As a result, if the constraint in question is not binding as much as expected, this analysis
  could reveal other similarly situated constraints that are more limiting and prevent the constraint in
  question from binding
- <u>U90 hours and rankings</u> of most limiting constraints associated with same corridors as the constraint in question
- <u>Comments</u> provide an assessment of whether modeling results are consistent with regional analysis and historical data and provide information on relevant transmission upgrades incorporated in the model



## Congestion not confirmed in modeling

Constraint	Comments
Branchburg Transformer	The Branchburg transformer is not binding in the model. The MMWG load flow case reflects an addition of the third transformer. The flow is however limited by other constraints up- and downstream of the Branchburg transformer
Kanawha-Matt Funk	The interface is not binding in the model. The load flow used in the model contains the Wyoming to Jackson's Ferry line which relieves the specified constraint
Minnesota – Wisconsin, Eau Claire-Arpin	The Eau Claire-Arpin constraint does not bind in the model. The MMWG 2007 load flow used in the model contains part of the Arrowhead-Weston upgrade (a 345 kV circuit from Stone Lake to Weston). This upgrade picks up a portion of the flow from Minnesota to Wisconsin and relieves flow on Eau Claire-Arpin
NE Kansas latan to Stranger Creek 345 kV	Conversation with SPP confirms that this constraint should not be causing problems except for non-firm curtailments
Tennessee to Georgia and into Atlanta constraints	The constraints do not bind in the model; several upgrades near Atlanta have been represented in the model including: Clermont Jct-South Hall Addition, Davis Street-East Point addition and Bull Sluice and Big Shanty substation upgrades.



## **Top Transmission Constraints not Addressed in Table 2**

- In Task 2 we identified 118 top transmission constraints in Eastern Interconnection. Of those, only 35 were mentioned in Table 2 either directly or indirectly
- Table 3 in Appendix 4-2 provides an assessment of all 118 top constraints. In this assessment, we evaluate the extent to which these top constraints overlap along certain corridors
- The findings from this assessment vary by market and discussed below



- Entergy: Top constraints not identified in Table 2 are either "local" – they appear to affect no corridors, or affect corridors that are different from those influenced by Table 2 constraints
- Florida: Top constraints not identified in Table 2 are either "local" – they appear to affect no corridors, or affect corridors that are different from those influenced by Table 2 constraints
- MAPP: All top constraint appear to be primarily related to the same corridor from NPPD to OPPD (Omaha)



- MISO: Top constraints not identified in Table 2 are either "local" – they appear to affect no corridors, or affect corridors that are different from those influenced by Table 2 constraints
- New England: With one exception, all top constraints are identified in Table 2. While this constraint appears to be affecting a different corridor (from NYISO Zone C to NEMA-Boston area), it also affect other corridors connecting upstate New York with NEMA-Boston similar to constraints included in Table 2
- NYISO: All top constraint that do not appear in Table 2 are related to same corridors as constraints that appear in Table 2



- MISO: Top constraints not identified in Table 2 are either "local" – they appear to affect no corridors, or affect corridors that are different from those influenced by Table 2 constraints
- New England: With one exception, all top constraints are identified in Table 2. While this constraint appears to be affecting a different corridor (from NYISO Zone C to NEMA-Boston area), it also affect other corridors connecting upstate New York with NEMA-Boston similar to constraints included in Table 2
- NYISO: All top constraint that do not appear in Table 2 are related to same corridors as constraints that appear in Table 2



- <u>SPP</u>: Some top constraint that do not appear in Table 2 are related to same corridors as constraints that appear in Table 2, some appear local (i.e. affecting no corridors), some of the not mentioned constraints are not related to mentioned constraints (two constraints in WERE and one between Cleco and Entergy)
- VACAR (non-Dominion): None of the top constraints identified for VACAR are mentioned in Table 2



## Table 3 in Appendix 4-2 explained

- Constraints are organized by market area
- Constraint name as modeled: abbreviations for relevant constraints representing the constrained area as used in the Task 2 model
- From Area, To Area: indicate ACPF areas in the load flow to which to ends of the monitored line(s) of the constraint belongs
- <u>El Ranking</u>: rankings with respect to four congestion criteria developed with respect to all modeled constraints for Eastern Interconnection (EI). Rankings are based on the 2008 Base Case simulation scenario. For non-binding constraints ranks in corresponding cell in the table appear blank
- Regional ranking: rankings with respect to four congestion criteria developed with respect to all modeled constraints for the market area/region. Rankings are based on the 2008 Base Case simulation scenario. For non-binding constraints ranks in corresponding cell in the table appear blank
- Absolute value: values for the four congestion criteria based on the 2008 Base Case.
- Corridors that are most impacted by constraint: as discussed in the Task 2 report, a
  corridor analysis identifies constraints that are first, second and third most limiting for
  an incremental power transfer from source to sink nodes of the corridor. The results of
  this analysis are compiled in the database. For a given constraint, this database is
  queried to determine up to three corridors that are most affected by that constraint



Congestion Area Path Number & Name or Map Reference Number	Constraint name as modeled	U90 hours	Constr	aint Ra	nking		Corridors t	hat are Most Impacte Constraints	d by	Constraints that are	e Most I	Limiting t	he Corr	idor		Comment
			Cong Rent	U90	Bind Hrs	Price	From Hub	To Hub	Corridor U90	Name	U90 hours	Cong Rent	U90	Bind Hrs	Price	
New Brunswick to Maine Le Preau to Orrington																Imports from New Brunswick to Maine are modeled based on historical flows
Southwest	SW Connecticut Impo	197	298	350	288	332	NYISO 6 NYF	NEPOOL 9 NWKST	8770	CP10 12 1-trips, ReacBus-	8676	79	2	2	127	The constraint itself does
Connecticut	Ovv Cormodicut impo	101	200	000	200	002		11E1 00E_0_11111101		Dvnp	0070	70	_	_	1.2.	not bind in the model; The flow on this interface is
										New England North-South	2405	105	140	96	206	limited by the frequently binding up stream
							NEPOOL_7_CT	NEPOOL_9_NWKST	8754	CP10_12_1-trips, ReacBus- Dvnp	8676	79	2	2	127	constrints.
										NORHR138 138-NRTHPT P 138- 1	286	355	327	219	355	
							NYISO_3_NYC	NEPOOL_9_NWKST		CP10_12_1-trips, ReacBus- Dvnp	8676	79	2	2	127	
										NORHR138 138-NRTHPT P 138- 1	286	355	327	219	355	
Maine to New Hampshire North South Interface	North New England Scobie	6647	32	18	16	88	NEPOOL_3_ME	NEPOOL_4_NEBOS	6692	North New England Scobie	6647	32	18	16	88	Modeling results are consistent with historical data
(Scobie)	New England North- South	21					NEPOOL_3_ME	NEPOOL_10_RI	6688	North New England Scobie	6647	32	18	16	88	
Into Boston	Boston Import	0	)				NEPOOL_2_NH	NEPOOL_4_NEBOS	6695	North New England Scobie	6647	32	18	16	88	The Boston imports constraints do not bind in the model; The MMWG 2007 loadflow used in the model contains part of the
	NEMA Boston Import	0	)				NEPOOL_3_ME	NEPOOL_4_NEBOS	6692	North New England Scobie	6647	32	18	16	88	NSTAR project which relieves the Boston Import
Southern New England	New England East- West Low	2118	128	157	118	225	NEPOOL_5_SE MA	NYISO_11_NYK	8784	CP10_12_1-tips, ReacBus- Dvnp	8676	79	2	2	127	Modeling results are consistent with historical data. Note that the flow on this constraint is also limited

Congestion Area Path Number & Name or Map Reference	Constraint name as modeled	U90 hours	Constra	aint Rar	nking		Corridors ti	hat are Most Impact Constraints	ed by	Constraints that are	Most I	_imiting th	ne Corri	idor		Comment
Number								I				1				
	SEMARI: SE MA RI Export	1					NEPOOL_5_SE MA	NYISO_9_NYI	8605	2TRIP Norwalk H-Northport	6972	104	10	10	92	by LIPA Import interface downstream
Northwest Vermont	W Rutland Tap - Blissvile 11	6732	234	13	8	196	NEPOOL_2_NH	NYISO_9_NYI	8771	W Rutland Tap - Blissvile 11	6732	234	13	8	196	Modeling results are consistent with historical data
Flows from Western to Eastern NY (Central East and Total East Interface)	16 I/F TOTAL EAST	1116	195	231	239	319	NYISO_3_NYC	NYISO_9_NYI	8687	1TRIP Leeds-Pleasant Val	5160	9	49	43	45	Modeling results are consistent with historical data
	7 I/F CENTRAL EAST	4803	43	57	56	145	NYISO_3_NYC	NYISO_7_NYG	6185	7 I/F CENTRAL EAST	4803	43	57	56	145	
Westchester to NYC (Sprainbrook - Dunwoodie South Interface: Sprainbrook-	I/F DUNWOODIE SOUTH	0					NYISO_6_NYF	NYISO_10_NYJ	8784	Actual:SPRBROOK- TREMONT	5279	157	41	65	166	Modeling results are consistent with historical data
Dunwoodie South, W. 49th St. 345 kV, Rainey to Dunwoodie 345 kV, Rainey to	1- TRIPS,SPRBROOK- W 49 ST - 2	3168	132	112	103	125	NYISO_8_NYH	NYISO_9_NYI	6506	1-TRIPS,SPRBROOK-W 49 ST - 2	3168	132	112	103	125	
Vernon 345 kV)	1- TRIPS,SPRBROOK- DUN NO T- 6	19					NYISO_8_NYH	NYISO_10_NYJ	8783	CP10_20_E179St_Hg4_E17 9St_Hg	5737	187	32	39	161	
Flows from Northern NY (Moses South Interface: Massena to Marcy, Moses to Adirondack)	7 I/F MOSES SOUTH OPEN	3967	114	80	85	220	NYISO_4_NYD	NYISO_2_NYB	8340	7 I/F MOSES SOUTH CLOSE	6039	25	27	18	71	Modeling results are consistent with historical data
, is structing	7 I/F MOSES SOUTH CLOSE	6039	25	27	18	71	NYISO_4_NYD	NYISO_7_NYG		7 I/F MOSES SOUTH CLOSE	6039	25	27	18	71	
Flows into Western NY (Dysinger East Interface: AES	8 I/F DYSINGER- EAST CLOSE	157					IESO_15_G	NYISO_2_NYB	8449	1454 - IMO-NYIS	2182	90	151	84	147	The flowgate itself does not bind significantly in the model. There are other

Congestion Area Path Number & Name or Map Reference	Constraint name as modeled	U90 hours	Constr	aint Rai	nking		Corridors t	hat are Most Impacto Constraints	ed by	Constraints that are	Most I	₋imiting tl	ne Corri	dor		Comment
Number Connected Rochester, Niagara to Rochester, Stolle to Meyer)	8 I/F DYSINGER- EAST OPEN	203	297	346	349	346	IESO_6_G	NYISO_2_NYB	8460	NFG7010 - IMO - ADIRONDACK	7200	88	7	5	76	limiting the flow from Ontario to western NY
Flows into Central NY (West Central Interface: Pannell Road to Clay, Stolle to Meyer)	14 I/F WEST CENTRAL CLOSE	2332	60	144	97	176	NYISO_1_NYA	NYISO_7_NYG	6792	14 I/F WEST CENTRAL OP LO	6791	41	12	12		Modeling results are consistent with historical data
	14 I/F WEST CENTRAL OPEN	6791	41	12	12	95	NYISO_1_NYA	NYISO_9_NYI	6868	14 I/F WEST CENTRAL OP LO	6791	41	12	12	95	
Westchester to Long Island (Coned-LIPA Interface: Dunwoodie to Shore Road, Sprain Brook to East Garden	Actual:HUDAVE E- JAMAICA	6699	137	15	9	67	NYISO_8_NYH	NYISO_11_NYK	8784	Actual:HUDAVE E- JAMAICA	6699	137	15	9		Modeling results are consistent with historical data; The "I/F LIPA IMPORT" is a flowgate containing all the specified
City)	1TRIP Dun-ShoreRd SpBrk-EGC	7721	67	5	3	120	NYISO_8_NYH	NYISO_11_NYK	8784	Actual:HUDAVE E- JAMAICA	6699	137	15	9		lines.
	NFG7007 - WESTCHESTER - LONG	4					NYISO_8_NYH	NYISO_11_NYK	8784	Actual:HUDAVE E- JAMAICA	6699	137	15	9	67	
Flows into NY Metro Region (UPNY-Coned Interface: Ladentown to Buchanan South, Pleasant Valley to	9 I/F UPNY - CON ED CLOSE	0					NYISO_6_NYF	NYISO_10_NYJ	8784	Actual:SPRBROOK- TREMONT	5279	157	41	65		The interface is not significantly binding in the model. The flow is mainly limited by the up- and downstream constraints
Wood St., Pleasant	9 I/F UPNY - CON ED OPEN	17					NYISO_8_NYH	NYISO_10_NYJ	8783	CP10_20_E179St_Hg4_E17 9St_Hg	5737	187	32	39	161	monitored in the model.

Congestion Area	Constraint name	U90 hours	Constra	nint Da	akina		Corridors t	nat are Most Impacted	1 hv	Constraints that are	Most I	imiting t	ho Corr	idor		Comment
Path Number & Name or Map Reference Number	as modeled							Constraints	·			illinuing u				
West Virginia to Virginia and Maryland Bedington-Black Oak and APS South (Doubs- Mt. Storm 500 KV line	APS South Interface	5140	1	50	98		VAP_7_G	VAP_33_MSA_DC_L	5395	APS South Interface	5140	1	50	98	38	Modeling results are consistent with historical data
and Meadowbrook Mt. Storm 500)	78 - Black Oak- Bedington 500	3452	68	99	223	193	AP_1_County_H arrison_G	AP_7_MSA_Hagerst own-Martinsburg_L	7615	APS South Interface	5140	1	50	98	38	
Central PA to Eastern PA (PJM Western Interface: Keystone &	INTERFACE= PJM - WESTERN	4681	3	60	101	100	PJM500_9_MSA _Pittsburgh_G	BGE_5_MSA_Baltim ore-Towson_L	7887	INTERFACE= PJM - WESTERN	4681	3	60	101	100	Modeling results are consistent with historical data
Eastern PA to New Jersey (PJM Eastern Interface: Wescosville	INTERFACE= PJM - EASTERN	3177	21	111	162	162	PJM500_7_MSA _York- Hanover_G	PECO_5_MSA_Phila delphia_L	3177	INTERFACE= PJM - EASTERN	3177	21	111	162	162	Modeling results are consistent with historical data
Branchburg Transformer	BRANCHBG 230- BRANCHBG 500	0					ntown_G	JCPL_1_MSA_NewY ork_L	7808	11 I/F UPNY - SENY OPEN	4952	34	54	54	169	The Branchburg transformer is not binding in the model. The MMWG load flow case reflects an addition of the
	70 - Branchburg- Flagtown 230	5724	29	34	37	47	PJM500_4_MSA _Philadelphia_G	PSEG_8_MSA_New York_G	7112	70 - Branchburg-Flagtown 230	5724	29	34	37		third transformer. The flow is however limited by other constraints up- and downstream of the
	71 - Branchburg- Readington 2	268					PJM500_4_MSA _Philadelphia_G	PSEG_3_MSA_New York_L	7009	70 - Branchburg-Flagtown 230	5724	29	34	37	47	Branchburg transformer
PJM to New York City Hudson to Farragut, Linden to Goethals	320 - Hudson 1- Farragut 1 34	939					PENELEC_2_M SA_DuBois_G	NYISO_10_NYJ	6961	RAMAPO 1000MW WHEEL	4300	144	70	13		Modeling results are consistent with historical data; the Ramapo and
	LINDEN 230- GOETHALS 230- 1	0					PENELEC_2_M SA_DuBois_G	NYISO_9_NYI	6925	RAMAPO 1000MW WHEEL	4300	144	70	13	167	Farragut constraints are used to model the contract flow from PSEG to NYC
	FARRGUT 1000MW WHEEL	5060	112	53	6	134	NYISO_8_NYH	NYISO_9_NYI	6506	FARRGUT 1000MW WHEEL	5060	112	53	6	134	
	RAMAPO 1000MW WHEEL	4300	144	70	13	167	PL_8_MSA_Alle ntown_G	JCPL_1_MSA_NewY ork_L	7808	RAMAPO 1000MW WHEEL	4300	144	70	13	167	

Congestion Area	Constraint name	U90 hours	Constr	aint Ra	nking		Corridors t	hat are Most Impacte	d by	Constraints that are	Most L	imiting tl		Comment		
Path Number & Name or Map Reference Number	as modeled							Constraints								
Ohio to West Virginia and Pennsylvania Wylie Ridge-Kammer	1130 - Wylie Ridge 345/500 X	3604	26	95	81	49	FE_9_MSA_Wei rton_G	AEP_2_L	5052	1130 - Wylie Ridge 345/500 X	3604	26	95	81		Modeling results are consistent with historical data
	637 - Sammis-Wylie Ridge 345	58	3				FE_9_MSA_Wei	AP_2_L	4618	1130 - Wylie Ridge 345/500 X	3604	26	95	81	49	
	335 - Kammer 765/500 Xfm (fl	156	6				AEP_8_G	AP_2_L	6148	148 - Cloverdale-Lexington 5	3856	4	84	74	34	
Illinois to Indiana	180 - Crete-St. John	1837	196	176	221	262	NI_2_MSA_Chic	AED 2 I	2404	178 - Crete-E. Frankfort 345	2198	101	150	157	171	Modeling results are
Crete-St. Johns Tap, Dune Acres-Michigan	345 B (	1037	196	170	221	202	ago_G	AEP_Z_L	2494	176 - Crete-E. Frankfort 345	2190	101	150	157		consistent with historical data
City, State Line-Wolf Lake	884 - Dune Acres- Michigan C	5592	36	37	64	13	Appears to be a local constraint affecting no									
	664 - State Line- Wolf Lake 1	3730	167	90	78	157	NIPS_8_MSA_C hicago_G	NI_13_MSA_Chicago _L	162	103 - Burnham-Munster 345	3730	167	90	78	157	
Central PA to Central NY Homer City-	1361 - Homer City- Watercure	81					PENELEC_2_M SA_DuBois_G	PL_7_MSA_Allentow n_L	7495	14 I/F WEST CENTRAL OPEN	6791	41	12	12		The interface is not significantly binding in the
Watercure, Homer City 345/230kV	317 - Homer City 345/230 Xfm	137	284	359	319	303	PENELEC_2_M SA_DuBois_G	NYISO_7_NYG	6924	14 I/F WEST CENTRAL OPEN	6791	41	12	12	95	model. The flow is mainly limited by the upstream constraints.
NW Pennsylvania to W. New York Erie West to Erie South, Erie E. to Erie SE 230 kV	1348 - Erie West- Erie South	1824	99	178	133	119	Appears to be a local constraint affecting no corridor									Modeling results are consistent with historical data
West Virginia to Southern Virginia Kanawha-Matt Funk	Kanawha-Matt Funk 345 BJF	0	)				AEP_8_G	VAP_7_G	6655	148 - Cloverdale-Lexington 5	3856	4	84	74		The interface is not binding in the model. The loadflow used in the model contains
	49305KANAWZ05M FUNK	0	)				AEP_8_G	VAP_7_G	6655	148 - Cloverdale-Lexington 5	3856	4	84	74		the Wyoming to Jackson's Ferry line which relieves the specified constraint.
North Carolina to Southern Virginia	299 - Halifax-Person 230 (fl	171	222	354	296		Durham_G	VAP_7_G		148 - Cloverdale-Lexington 5	3856	4	84	74	,	The interface is binding in the model but not in the top list. The flow is mainly limited by the Cloverdale-
	1228 - Clover 230/500 Xfm (f	320	199	318	318	257	CPLE_1_MSA_ Durham_G	VAP_15_MSA_VB- Norfolk_L	6487	1228 - Clover 230/500 Xfm (f	320	199	318	318	257	Lexington constraint.
		320	199	318	318	257			6487	1228 - Clover 230/500 Xfm (f	320	199	318	318	257	

Congestion Area Path Number & Name	Constraint name	U90 hours	Constr	aint Rar	nking		Corridors t	hat are Most Impacted	d by	Constraints that are	e Most I	_imiting t	he Corri	idor		Comment
or Map Reference Number																
Michigan to Ontario Belle River - St. Clair 345 kV	690 - St. Clair 345/230 Xfm	1419	359	208	129	360	ITC_7_MSA_Mo nroe_G	IESO_2_G	7404	1343 - Detroit Industrial-Wa	7404	289	105	63	317	Modeling results are consistent with historical data
	19BUNCE 230- SCOTT 220- 1	6014	345	28	17	348	ITC_7_MSA_Mo nroe_G	IESO_3_L	7987	19BUNCE 230-SCOTT 220- 1	7987	345	28	17	348	
	ONT Hydro to Michigan	144	224	358	335	286	ITC_7_MSA_Mo nroe_G	IESO_11_G	6962	19BUNCE 230-SCOTT 220- 1	6962	345	28	17	348	
Manitoba to Minnesota																The flow from Manitoba to Minnesota is modeled based on the historical flow
Minnesota to Wisconsin Eau Claire-Arpin, Minnesota-	1528 - Eau Claire- Arpin 345	0					nneapolis_G	WEC_7_MSA_Milwa ukee_G		NFG3033 - Arpin Xformer+Arpi	1852	75	174	143		The Eau Claire-Arpin constraint does not bind in the model. The MMWG
Wisconsin Stability Interface	468 - Minnesota- Wisconsin St	0					XEL_3_MSA_Mi nneapolis_G	WEC_3_MSA_Milwa ukee_G	4631	NFG3033 - Arpin Xformer+Arpi	1852	75	174	143		2007 loadflow used in the model contains part of the Arrowhead-Weston upgrade (a 345 kV circuit from Weston to Stone Lake). This upgrade shares a portion of the flow from Minnesota to
Upper Peninsula Michigan to Wisconsin Flow	1001 - Nordic-Perch Lake 138 249 - ATC Flow	2849	158	121	67	118	Appears to be a local constraint affecting no corridor									Modeling results are consistent with historical data
South	South						cornaor									
Illinois and Iowa to Wisconsin Paddock Transformer	546 - Paddock 345/138 Xfm (f	676	305	269	362		NI_7_MSA_Roc helle_G	WEC_3_MSA_Milwa ukee_G	4580	406 - Marengo-Pleasant Valle	3705	39	91	94		The interface is binding in the model, but not in the top list. The flow is mainly
W. Nebraska to W. Kansas Gentleman-	SPP 93-WNE_WKS	7724	17	4	7	15	NPPD_4_G	OPPD_5_MSA_Oma ha_L	8367	SPP 93-WNE_WKS	7724	17	4	7	15	Modeling results are consistent with historical
LGE System Blue Lick 345 k/161/ Xfmr, Frankfort to East-	1156 - Blue Lick 345/161 Xfm	1942					LGEE_3_G	AEP_2_L	4295	246 - Frankfort East-Tyrone	4252	23	72	59	8	Modeling results are consistent with historical data
Tyrone 138 kV	246 - Frankfort East- Tyrone	4252	23	72	59	8	LGEE_3_G	LGEE_5_MSA_Lexin gton_L	4258	246 - Frankfort East-Tyrone	4252	23	72	59	8	

Congestion Area Path Number & Name	Constraint name	U90 hours	Constra	aint Rai	nking		Corridors t	hat are Most Impacted	d by	Constraints that are	Most I	_imiting t	he Corr	idor		Comment
or Map Reference Number	as moueled							Constraints								
Wisconsin Stiles- Amberg and Crivitz 138 kV, Kewaunee 345/138 Xfmr, Highway-Preble 138 kV		2849 0 0		121	67	118	Appears to be a local constraint affecting no corridor									Modeling results are consistent with historical data; the "ATC south" constraint constains the specified lines
Indiana-Ohio Border - Miami Fort 345/138 kV	437 - Miami 345/138 Xfm (flo		304	332	344	314	Appears to be a local constraint affecting no									The previous study shows that this constraint is binding about 400 hours a year.
	424 - Miami Fort 345/138 Xfm	8					corridor									Modeling results indicates about 260 U90 hours. The results are consistent.
	978 - Miami Fort 345/138 Xfm	0														results are consistent.
	1-TRIPS,09MIAMI -	0														
III'm a la da Mandaral a	1005	00					AMDN: 40 MOA	TVA 5 MOA NI-LUI	F.140	1216 - Cumberland-	5400	40	40	70	00	The second state of the second bits of
Illinois to Kentucky	1225 - Joppa 345/161 Xfmr (f	68					AMRN_12_MSA _StLouis_L	TVA_5_MSA_Nashvil le_L	5412	Davidson 5	5196	13	46	79	96	The constraint does not bind in the model. The flow from AMRN to TVA is mainly
										1266 - Fredtown-Fredtown Tap	213	239	342	338	202	limited by the downstream constraints.
W. Oklahoma to W. Texas Elk City 230/138 kV	237 - Elk City 230/138 Xfm (	25					AEPW_5_MSA_ Tulsa_G	SPS_2_G	8784	SPP 69-SPPSPSTIES	5176	46	48	23		The interface is not significantly binding in the model. The flow is mainly
Transformer										FG 5196 SPS North - South	7167	11	8	15	18	limited by constraints in northwest Texas.
Central Oklahoma Redbud-Arcadia 345 Kv	SPP 59- REDARCREDARC	5505	5	38	35	32	AEPW_5_MSA_ Tulsa_G	EES_9_MSA_Russel lville_G	5900	SPP 59-REDARCREDARC	5505	5	38	35		Modeling results are consistent with historical data. Based on the information that became availabel after the modeling have been completed, this constraints is currently being resolved
Southeast Oklahoma - - Valliant-Lydia 345 kV	-SPP 57- PITSEMPITSUN	1372	172	215	202	234	EES_9_MSA_R ussellville_G	OKGE_4_MSA_Okla homaCity_L	3996	SPP 57-PITSEMPITSUN	1372	172	215	202	234	Modeling results are consistent with historical

Congestion Area Path Number & Name	Constraint name as modeled	U90 hours	Constr	aint Rar	nking		Corridors th	nat are Most Impacted Constraints	l by	Constraints that are	Most I	imiting tl	ne Corri	idor		Comment
or Map Reference Number																
345 kV	1415 - Valliant-Lydia 345	0						OKGE_4_MSA_Okla homaCity_L	1435	SPP 68-SILDIVNWSCIM	101					
Arkansas to Oklahoma Ft. Smith 500/345 kV Transformer	255 - Fort Smith 500/161 Xfm	0						OKGE_4_MSA_Okla homaCity_L	5940	SPP111-SUMHE_BULSLD	3178	58	110	62		Historical data shows 40 hours level 3 TLR. The constraints are binding about 400 hours in the
	254 - Fort Smith- Arkansas Nu	437	231	299	224	230		OKGE_4_MSA_Okla homaCity_L	4668	SPP 76-SUNXFRPITSEM	4050	12	78	61	5	model. The results are consistent.
NE Kansas latan to Stranger Creek 345 kV	SPP 32- IASCLKNASJHA	0						AMRN_12_MSA_StL ouis_L	3893	SPP 89-COOPER_S	1383	183	214	190		Conversation with SPP confirms that this constraint should not be causing problems except for non-firm
	695 - StjLaklatStr	0														curtailments
SE Missouri to NE Arkansas	FG 1382 Blytheville - Hayti	1584	242	195	181	235		EES_9_MSA_Russel lville_G	4674	FG 1382 Blytheville - Hayti	1584	242	195	181	235	Modeling results are consistent with the historical data
Central Arkansas to S. Arkansas	FG 1341 Sheridan- EIDorado_Ho	407		301	255		ussellville_G	EES_1_MSA_Jackso n_L		FG 1330 McAdams500- 230_McAda	364	241	309	273	260	Modeling results are consistent with historical data
	1-TRIPS,8ELDEHV - 3ELDEHV - 1	1764	71	180	160	85	Appears to be a local constraint affecting no									
Into New Orleans	FG 1376 Coly- Vignes for the	6308	16	20	30	22		EES_5_MSA_NewOr leans_G	6322	FG 1376 Coly-Vignes for the	6308	16	20	30	22	Modeling results are consistent with historical data
	NFG1314 - Little Gypsy-South	3863	27	83	111	36	EES_10_MSA_V	EES_5_MSA_NewOr leans_G	6331	FG 1376 Coly-Vignes for the	6308	16	20	30	22	
SE Louisiana to W Louisiana	607 - Richard 500/138 Xfm #2	634	252	272	271	269	Appears to be a local constraint affecting no									Modeling results are consistent with historical data

•	Constraint name	U90 hours	Constr	aint Rar	nking		Corridors th	nat are Most Impacte	d by	Constraints that are	e Most I	imiting t	ne Corri	dor		Comment
or Map Reference Number	as modeled							Constraints								
	1- TRIPS,8RICHARD- 8WEBRE - 1	0					corridor									
	FG 1330 McAdams500- 230_McAda	364	241	309	273			EES_9_MSA_Russel lville_G	1253	FG 1330 McAdams500- 230_McAda	364	241	309	273		Modeling results are consistent with historical data
Tennessee to Kentucky Volunteer to Sullivan	747 - Volunteer- Phipps Bend	0					TVA_4_MSA_CI arksville_G	AEP_2_L	5272	1216 - Cumberland- Davidson 5	5196	13	46	79		The constraint is not binding in the model. The flow are mainly limited by the upstream constrait.
Flows into Western Tennessee Cumberland-Davidson, Johnsonville-Davidson	1216 - Cumberland- Davidson 5	5196	13	46	79			TVA_5_MSA_Nashvil le_L	5984	1216 - Cumberland- Davidson 5	5196	13	46	79	96	Modeling results are consistent with the historical data
Tennessee to Georgia	1223 - Sequoyah- Conasauga 50	6						SOCO_16_MSA_Atla nta_L	155	1223 - Sequoyah- Conasauga 50	6					The constraints do not bind in the model; Several upgrades near Atlanta have been represented in the model including: Clermont Jct-South Hall Addition, Davis Street-East Point Addition and Bull Sluice and Big Shanty substation upgrades.
E. Georgia to E. Florida Southern FRCC Interface	SOUTHERN - GRIDFLORIDA	3355	15	102	70	111		FPC_3_MSA_Orland o_L	4390	SOUTHERN - GRIDFLORIDA	3355	15	102	70		Modeling results are consistent with historical data
	FG 1519 8THALMAN 500 DUVAL 5	2896	81	119	154	204	SOCO_26_MSA _Macon_G	FPC_4_MSA_Tampa _L	4895	SOUTHERN - GRIDFLORIDA	3355	15	102	70	111	

Congestion Area Path Number & Name or Map Reference Number		U90 hours	Constra	aint Rar	nking		Corridors th	nat are Most Impacted Constraints	l by	Constraints that are	Most L	imiting t	he Corri	dor		Comment
Eastern South Carolina	1-TRIPS,6CROAS - 6JEFF - 1	2236	152	146	226	201	SCPSA_10_MS A_Charleston_G	SCPSA_2_MSA_Cha rleston_L	2236	1-TRIPS,6CROAS -6JEFF - 1	2236	152	146	226		Modeling results are consistent with the historical data
Atlanta	1- TRIPS,6CONYERS- 3CONYERS- 1	0						SOCO_33_MSA_Atla nta_L		1216 - Cumberland- Davidson 5	5196	13	46	79		The constraints do not bind in the model; Several upgrades have been represented in the model
	1- TRIPS,6WDLAWN - 6NMARIET- 1	89						SOCO_8_MSA_Atlan ta_L		1216 - Cumberland- Davidson 5	5196	13	46	79		including: Clermont Jct- South Hall Addition, Davis Street-East Point Addition and Bull Sluice and Big
	1223 - Sequoyah- Conasauga 50	6					TVA_5_MSA_Na shville_L	SOCO_16_MSA_Atla nta_L		1223 - Sequoyah- Conasauga 50	5196	13	46	79	96	Shanty substation upgrades

Legend used in the tables	Implication
	Constraint appears in Table 2 as a critical constraint identified in regional studies or as related to such a constraint along one or several significant corridors
	Constraint does not appear in Table 2 but affects one or several siginificant corridors
	Constraint does not appear in Table 2 and does not affect any significant corridors (may be considered as local constraints)
Criteria El ranks	All ranks shown are based on the Base Case 2008 results All constraints were ranked with respect to the following criteria  Congestion rent U90  Number of binding hours All-hours shadow price The lower is the rank the more serious is the congestion A constraint is included in this list if and only if it is ranked at or below 100 according to at least one of the above criteria in each of the 6 simulated scenarios
Regional ranks	Regional ranks reflect the order of EI ranks
Corridors	Corridors are identified by source hubs (nodes) and sink hubs (nodes) A constraint affects a corridor in a given hour if it is the first, second or thrid most limiting in the ATC calcualtion for the corridor For each constraint, up to three corridors were selected on the basis of the number of hours the constraint limits the ATC calculation for the corrdior

 Table 3. Top Constraints, Ranks and Most Affected Corridors

			T									
Constraint	Corrido	or										
Constraint Name	From	To Area		El Ra	nkings		F	Regional	l Rankin	g		Valı
	Area		Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
FG 1376 Coly-Vignes for the	LAGN	EES	16	20	30	22	1	3	8	1	107.21	6308
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	20	6	4	28	2	2	2	3	99.03	7354
NFG1314 - Little Gypsy-South	EES	EES	27	83	111	36	3	10	12	4	75.01	3863
NFG1350 - North Crowley-Scot	LAGN	EES	45	98	106	26	4	11	11	2	46.32	3471
FG 1324 WhiteBluff-Sheridan	EES	EES	59	164	144	149	5	13	13	13	30.06	1977
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	71	180	160	85	6	14	14	10	23.63	1764
FG 1379 Grimes-Mt Zion for t	EES	EES	72	1	1	42	7	1	1	5	23.60	8719
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	110	21	22	79	8	4	3	7	12.18	6288
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	111	22	24	81	9	5	4	8	12.08	6239
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	115	26	27	87	10	6	6	11	11.76	6083
FG 1308 Dodson-Danville_Hart	EES	EES	154	31	26	83	11	7	5	9	6.39	5742
FG 1380 Batesville-Marks for	EES	EES	171	40	28	77	12	8	7	6	4.72	5417
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	228	101	83	140	13	12	10	12	1.80	3385
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	281	76	58	195	14	9	9	14	0.72	4088

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor				From hub	AEPW_9_MSA_ MountPleasant_ G	AEPW_9_MSA_ MountPleasant_ G	EES_10_MSA_Vi cksburg_G	EES_9_MSA_Ru ssellville_G	EES_9_MSA_Ru ssellville_G	EES_9_MSA_Ru ssellville_G	LAGN_1_MSA_B atonRouge_G
Constraint Name	From Area	To Area	ues		qnH	ISA_B	_9_MSA_R liville_G	EES_5_MSA_N ewOrleans_G	EES_1_MSA_J ackson_L	_MSA_N ans_G	EES_7_MSA_B eaumont- PortArthur_G	_5_MSA_N rleans_G
	Area		Bind Hrs	All-hrs Price	To	EES_7_MS eaumont- PortArthur_	EES_9_M8 ussellville_	EES_5 ewOrle	EES_1_N ackson_L	EES_5_MSA ewOrleans_G	EES_7_MS eaumont- PortArthur_	EES_5_MS ewOrleans
FG 1376 Coly-Vignes for the	LAGN	EES	4408	26.42				Х				Х
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	7326	20.24								
NFG1314 - Little Gypsy-South	EES	EES	1372	14.98				Х		Х		Х
NFG1350 - North Crowley-Scot	LAGN	EES	1437	24.41								
FG 1324 WhiteBluff-Sheridan	EES	EES	858	1.98			Х		Х		Х	
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	687	6.00								
FG 1379 Grimes-Mt Zion for t	EES	EES	8622	13.04		Х	Х					
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	4934	6.16								
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	4894	6.11								
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	4784	5.95								
FG 1308 Dodson-Danville_Hart	EES	EES	4790	6.06							Х	
FG 1380 Batesville-Marks for	EES	EES	4777	6.18								
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	1884	2.14								
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	2653	1.03								

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corrido	,	SOCO_32_MSA_ Pascagoula_6
Constraint Name	From Area	To Area	EES_5_MSA_N ewOrleans_G
FG 1376 Coly-Vignes for the	LAGN	EES	Х
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	
NFG1314 - Little Gypsy-South	EES	EES	
NFG1350 - North Crowley-Scot	LAGN	EES	
FG 1324 WhiteBluff-Sheridan	EES	EES	
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	
FG 1379 Grimes-Mt Zion for t	EES	EES	
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	
FG 1308 Dodson-Danville_Hart	EES	EES	
FG 1380 Batesville-Marks for	EES	EES	
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corridor											
constraint Name	From	To Area		El Rar	nkings		i	Regional	Rankin	g		Valı
	Area	10704	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
SPP 93-WNE_WKS	NPPD	NPPD	17	4	7	15	1	1	1	3	107.06	7724
1441 - Grand Island-Aurora 1	NPPD	NPPD	37	74	36	7	2	2	2	1	55.03	4125
901 - Galesburg 161/138 Xfm	MEC	IP	65	108	88	14	3	3	4	2	26.47	3207
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	159	109	49	51	4	4	3	4	6.10	3184

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor				From hub	NPPD_4_G
Constraint Name	From	To Area	ues			5_MSA_ _L
Constraint Name	Area	10 Alea	Bind Hrs	All-hrs Price	To Hub	OPPD_ <del>{</del> Omaha_
SPP 93-WNE_WKS	NPPD	NPPD	6821	30.09		Х
1441 - Grand Island-Aurora 1	NPPD	NPPD	3842	45.73		Х
901 - Galesburg 161/138 Xfm	MEC	IP	1813	30.14		
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	3183	10.37		

Table 3. Top Constraints, Ranks and Most Affected Corridors

•													
Constraint	Corridor												
Constraint Name	From	To Area		El Rai	nkings		ı	Regional	Rankin	g	v		
Constraint Name	Area	10 Alea	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	
SOUTHERN - GRIDFLORIDA	FPL	SOCO	15	102	70	111	1	3	1	3	113.35	3355	
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	106	161	114	70	2	2	2	1	12.52	2027	
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	136	120	122	72	3	1	3	2	8.97	2853	

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor				From hub	SOCO_15_MSA_Bir mingham_G	SOCO_28_MSA_Bir mingham_G	SOCO_31_MSA_Atl anta_G
Constraint Name From Area		To Area	ues	All bara	Hub	3_MSA_0	3_MSA_O	3_MSA_O
			Bind Hrs	All-hrs Price	То Н	FPC_3 rlando_	FPC_3 rlando_	FPC_3 rlando_
SOUTHERN - GRIDFLORIDA	FPL	SOCO	2300	3.58		Х	Х	Х
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	1327	7.12				
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	1184	6.80				

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corrido												
	From			El Rai	nkings		i	Regiona	l Rankin	g	Val		
Constraint Name	Area	To Area	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	
1203 - Leesburg-Northeast 13	NIPS	NIPS	8	52	80	2	1	10	17	1	164.51	5109	
1162 - Dune Acres-Michigan C	NIPS	NIPS	14	62	66	4	2	13	13	2	116.72	4585	
1509 - Bain-Kenosha 138 (flo	WEC	WEC	28	66	51	17	3	14	9	5	72.66	4476	
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	33	206	147	19	4	23	21	6	59.14	1427	
884 - Dune Acres-Michigan C	NIPS	NIPS	36	37	64	13	5	3	12	4	55.72	5592	
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	42	69	50	35	6	15	8	11	48.06	4411	
SPP 69-SPPSPSTIES	WEPL	SPS	46	48	23	48	7	8	3	14	44.81	5176	
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	47	122	119	44	8	20	18	13	44.16	2834	
876 - Cranberry Loop 115kV	WPS	WPS	52	209	215	31	9	24	25	9	34.84	1417	
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	57	61	71	54	10	12	16	16	30.50	4671	
679 - Spencer-Triboji 161 (f	ALTW	WAPA	61	159	120	33	11	21	19	10	29.54	2091	
519 - Northpoint-Dewey 115 (	ALTE	WPS	63	44	29	12	12	6	4	3	27.75	5212	
1272 - Oak Creek 345/230 Xfm	WEC	WEC	66	39	52	53	13	4	10	15	25.98	5452	
1196 - Smith-Green River Ste	LGEE	LGEE	78	30	41	56	14	2	7	17	21.98	5799	
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	80	47	32	24	15	7	6	8	21.75	5188	
Petersburg 345/138 Xfm E	IPL	IPL	87	247	187	37	16	26	23	12	18.36	862	
1253 - Genoa-Coulee 161 (flo	XEL	DPC	97	232	189	69	17	25	24	18	15.40	1092	
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	109	100	68	20	18	17	15	7	12.35	3440	
1204 - Farr RDJ-Tippy 138 (f	METC	METC	126	185	126	74	19	22	20	19	10.07	1742	
WNTR ST7 115 HIBBARD7 115	MP	MP	129	51	21	75	20	9	2	20	9.96	5112	
249 - ATC Flow South	WEC	WPS	158	121	67	118	21	19	14	23	6.12	2849	
SLVRBYH7 115 TWO HBR7 115	MP	MP	177	59	31	103	22	11	5	22	4.09	4745	
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	216	77	184	128	23	16	22	24	2.08	4085	
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	235	316	294	91	24	27	26	21	1.67	329	
1343 - Detroit Industrial-Wa	ITC	ITC	289	105	63	317	25	18	11	25	0.61	3238	
19BUNCE 230-SCOTT 220- 1	ITC	IESO	345	28	17	348	26	1	1	26	0.07	6014	

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor		luos			AEPW_5_M SA_Tulsa_G	ALTE_2_MS A_Madison_	ITC_7_MSA _Monroe_G	ITC_7_MSA _Monroe_G	ITC_7_MSA _Monroe_G	ITC_7_MSA _Monroe_G	MEC_3_MS A_DesMoine s_G	NI_7_MSA_ Rochelle_G
Constraint Name	From	To Area	ies			ගු	_MSA_ polis_	MSA_C d_L		2_G		AMRN_12_M SA_StLouis_L	l l
Constraint Name	Area	10 Alea	Bind Hrs	All-hrs Price	To Hub	SPS_2	XEL_3_MSA_ // Minneapolis_ //	FE_5_MSA leveland_L	IESO_11_G	IESO_2	IESO_3_L	AMRN SA_Stl	WEC_3_MS/ _Milwaukee_ G
1203 - Leesburg-Northeast 13	NIPS	NIPS	1959	84.36									
1162 - Dune Acres-Michigan C	NIPS	NIPS	2434	69.57									
1509 - Bain-Kenosha 138 (flo	WEC	WEC	3130	28.82									
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	827	28.17									
884 - Dune Acres-Michigan C	NIPS	NIPS	2483	33.21									
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	3151	16.48									
SPP 69-SPPSPSTIES	WEPL	SPS	4915	10.48		Х							
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	1265	12.57								Х	
876 - Cranberry Loop 115kV	WPS	WPS	252	18.89									
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	2299	9.64									
679 - Spencer-Triboji 161 (f	ALTW	WAPA	1192	17.24			Х						
519 - Northpoint-Dewey 115 (	ALTE	WPS	4707	33.97									
1272 - Oak Creek 345/230 Xfm	WEC	WEC	3126	9.86									Х
1196 - Smith-Green River Ste	LGEE	LGEE	3519	9.51									
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	4250	25.80									
Petersburg 345/138 Xfm E	IPL	IPL	438	13.93									
1253 - Genoa-Coulee 161 (flo	XEL	DPC	432	7.30									
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	2321	28.12									
1204 - Farr RDJ-Tippy 138 (f	METC	METC	1128	6.37									
WNTR ST7 115 HIBBARD7 115	MP	MP	5001	6.23									
249 - ATC Flow South	WEC	WPS	2368	3.17									
SLVRBYH7 115 TWO HBR7 115	MP	MP	4386	4.75									
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	450	2.52									
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	71	5.59									
1343 - Detroit Industrial-Wa	ITC	ITC	2503	0.08				Х		Х	Х		
19BUNCE 230-SCOTT 220- 1	ITC	IESO	5637	0.02					Х	Х	Х		

Table 3. Top Constraints, Ranks and Most Affected

Constraint		OTP_9_G	WEC_1_MS A_Chicago_	
Constraint Name	From Area	To Area	XEL_3_MSA_ (Minneapolis_	NI_13_MSA_ Chicago_L
1203 - Leesburg-Northeast 13	NIPS	NIPS		
1162 - Dune Acres-Michigan C	NIPS	NIPS		
1509 - Bain-Kenosha 138 (flo	WEC	WEC		Х
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	Х	
884 - Dune Acres-Michigan C	NIPS	NIPS		
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	Х	
SPP 69-SPPSPSTIES	WEPL	SPS		
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN		
876 - Cranberry Loop 115kV	WPS	WPS		
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP		
679 - Spencer-Triboji 161 (f	ALTW	WAPA		
519 - Northpoint-Dewey 115 (	ALTE	WPS		
1272 - Oak Creek 345/230 Xfm	WEC	WEC		
1196 - Smith-Green River Ste	LGEE	LGEE		
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	Х	
Petersburg 345/138 Xfm E	IPL	IPL		
1253 - Genoa-Coulee 161 (flo	XEL	DPC		
MINVALY7 115-MINVALT4 230- 1	XEL	XEL		
1204 - Farr RDJ-Tippy 138 (f	METC	METC		
WNTR ST7 115 HIBBARD7 115	MP	MP		
249 - ATC Flow South	WEC	WPS		
SLVRBYH7 115 TWO HBR7 115	MP	MP		
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	Х	
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE		
1343 - Detroit Industrial-Wa	ITC	ITC		
19BUNCE 230-SCOTT 220- 1	ITC	IESO		

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corridor											
constraint Name	From	To Area		El Rar	nkings		F	Regional	Rankin	g		Valı
Constraint Name	Area	TO Alea	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
North New England Scobie Low	NEPOOL	NEPOOL	32	18	16	88	1	3	3	1	59.92	6647
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	104	10	10	92	2	1	2	2	14.08	6972
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	223	96	48	205	4	4	4	4	1.95	3571
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	234	13	8	196	5	2	1	3	1.67	6732

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor				From hub	NEPOOL_2_NH	NEPOOL_2_NH	NEPOOL_2_NH	NEPOOL_3_ME	NEPOOL_3_ME	NEPOOL_5_SE MA	NEPOOL_7_CT	NYISO_3_NYC	NYISO_6_NYF	NYISO_6_NYF	NYISO_6_NYF
Constraint Name	From	To Area	ues			10_RI	10_NYJ	IYN_6	10_RI	4_NE	IAN_6	IVN_6	4_NE	10_RI	4_NE	IYN_e
Constraint Name	Area	TO Area	Bind Hrs	All-hrs Price	To Hub	NEPOOL	NYISO	NYISO_	NEPOOL	NEPOOL BOS	NYISO_9	NYISO_9	NEPOOL BOS	NEPOOL	NEPOOL BOS	OSIAN
North New England Scobie Low	NEPOOL	NEPOOL	5840	5.93		Х			Х	Х						
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	6423	5.58							Х	Х				Х
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	3186	0.91				, in the second					Х			
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	6555	1.02			Х	Х							Х	

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Table 6. Top constraints, Ranks												
Constraint	Corrido	•										
Constraint Name	From	To Area		El Raı	nkings		F	Regional	Rankin	g		Valı
Constraint Name	Area	TO Alea	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO	2	73	44	30	1	20	14	1	282.33	4148
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	9	49	43	45	2	13	13	4	163.54	5160
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO	25	27	18	71	3	11	8	7	80.99	6039
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	31	19	53	82	4	8	15	9	62.70	6461
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	34	54	54	169	5	15	16	19	58.79	4952
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	41	12	12	95	6	5	7	11	50.32	6791
7 I/F CENTRAL EAST LO	NYISO	NYISO	43	57	56	145	7	16	17	17	47.80	4803
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	44	116	117	191	8	25	21	20	46.32	3078
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	67	5	3	120	9	3	2	14	25.41	7721
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	70	25	20	40	10	10	9	2	23.69	6089
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	79	2	2	127	11	1	1	15	21.87	8676
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	85	58	38	41	12	17	11	3	19.78	4746
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	88	7	5	76	13	4	3	8	18.32	7200
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	100	124	73	52	14	26	18	5	14.75	2803
FARRGUT 1000MW WHEEL	NYISO	NYISO	112	53	6	134	15	14	4	16	12.07	5060
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	114	80	86	220	16	21	19	21	11.89	3967
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	117	17	11	98	17	7	6	13	11.49	6670
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	123	89	146	93	18	23	22	10	10.46	3731
Actual:E179 ST-HG 6	NYISO	NYISO	130	136	92	97	19	27	20	12	9.88	2474
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	137	15	9	67	20	6	5	6	8.94	6699
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	187	32	39	161	21	12	12	18	3.48	5737
Actual:DUN SO1R-E179 ST	NYISO	NYISO	357	3	180	356	22	2	23	22	0.01	7745
Actual:V STRM P-JAMAICA	NYISO	NYISO	360	65	34	358	23	19	10	23	0.00	4480
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	365	23	366	365	24	9	24	24	-	6232
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	368	64	370	368	25	18	25	25	-	4487
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	371	86	371	371	26	22	26	26	-	3799

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor				From hub	IESO_15_G	IESO_6_G	IESO_7_G	ITC_3_MSA_D etroit_G	NEPOOL_2_N H	NEPOOL_5_SE MA	NEPOOL_7_CT	NEPOOL_7_CT	NYISO_1_NYA	NYISO_1_NYA
Constraint Name	From	To Area	ues		a	2_NY	2_NY	NYISO_2_NY B	FE_5_MSA_ Cleveland_L	NYISO_10_N YJ	NYISO_11_N YK	OL_9_	YN_6_OSIYN	NYISO_7_NY G	NYISO_9_NY
	Area		Bind Hrs	All-hrs Price	To Hub	NYISO_ B	NYISO_ B	NYISC B	FE_5_ Clevel	NYISC YJ	NYISC YK	NEPOOL_ NWKST	NYISC	NYISC G	NYISC
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO	3259	18.91											
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	3340	12.11								Х	Х		
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO	5343	7.09											
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	3056	6.08										Х	Х
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	2919	1.50								Х	Х		
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	6196	5.21					Х						
7 I/F CENTRAL EAST LO	NYISO	NYISO	2742	2.07											
11 I/F UPNY - SENY CLOSE LO		NYISO	1294	1.04									Х		
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	7466	3.13								Х			
1TRIP Reynld-GBush NScot-Alp		NYISO	5246	13.69											
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	8533	2.63								Х			
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	3678	13.32											
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	6966	6.21		Х			Х						
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	2194	9.94											
FARRGUT 1000MW WHEEL	NYISO	NYISO	6903	1.37									Х		
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	1879	0.72		Х	Х	Х							
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	6359	5.05		х	Х	Х							
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	837	5.27											
Actual:E179 ST-HG 6	NYISO	NYISO	1765	5.07						Х					
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	6503	7.89											
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	3583	1.62											
Actual:DUN SO1R-E179 ST	NYISO	NYISO	495	0.00											
Actual:V STRM P-JAMAICA	NYISO	NYISO	4166	0.00							Х				
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	0	0.00		Х	Х	Х							
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	0	0.00											
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	0	0.00											

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor		NYISO_3_NYC	NYISO_3_NYC	NYISO_3_NYC	NYISO_3_NYC	NYISO_6_NYF	NYISO_6_NYF	NYISO_6_NYF	NYISO_6_NYF	NYISO_6_NYF	NYISO_8_NYH	NYISO_3_NYC	NYISO_6_NYF	NYISO_8_NYH
Constraint Name	From Area	To Area	NYISO_10_N YJ	NYISO_7_NY I G	PSEG_3_MS A_NewYork_ L	PSEG_8_MS A_NewYork_ G	NEPOOL_10 _RI	NEPOOL_6_ WCMA	NEPOOL_9_ NWKST	NYISO_10_N YJ	PSEG_3_MS A_NewYork_	NYISO_10_N YJ	NYISO_11_N YK	NYISO_11_N YK	NYISO_11_N YK
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO													
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO									Х				
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO													
14 I/F WEST CENTRAL OP HI	NYISO	NYISO													
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO													
14 I/F WEST CENTRAL OP LO	NYISO	NYISO													
7 I/F CENTRAL EAST LO	NYISO	NYISO		Х	Х	Х									
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO		Х					Х						
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO							Х						
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO						Х							
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO					Х		Х						
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO													
NFG7010 - IMO - ADIRONDACK	NYISO	IESO													
Actual:GRENWOOD-VERNON-E	NYISO	NYISO													
FARRGUT 1000MW WHEEL	NYISO	NYISO										Х			
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO													
NFG7105 - ADIRONDACK - IMO	NYISO	IESO													
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO													
Actual:E179 ST-HG 6	NYISO	NYISO	Х							Х		Х			
Actual:HUDAVE E-JAMAICA	NYISO	NYISO											х	х	Х
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	Х							Х		Х			
Actual:DUN SO1R-E179 ST	NYISO	NYISO								Х		Х			
Actual:V STRM P-JAMAICA	NYISO	NYISO							Х				х		
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO													
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO													
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO													

Table 3. Top Constraints, Ranks and Most Affected

			1	_	I <del>-</del>		
Constraint	Corridor		NYISO_8_NYH	PENELEC_2_M SA_DuBois_G	PENELEC_2_M SA_DuBois_G	PJM500_9_MS A_Pittsburgh_G	PL_8_MSA_All entown_G
Constraint Name	From Area	To Area	NYISO_9_NY I	NYISO_10_N YJ	PL_7_MSA_A llentown_L	PL_7_MSA_A	JCPL_1_MSA_PL_8_MSA _NewYork_L_entown_G
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO					
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO					
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO					
14 I/F WEST CENTRAL OP HI	NYISO	NYISO				Х	
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO					Х
14 I/F WEST CENTRAL OP LO	NYISO	NYISO			Х	Х	
7 I/F CENTRAL EAST LO	NYISO	NYISO					
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO					
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO					
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO					
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO					
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO					
NFG7010 - IMO - ADIRONDACK	NYISO	IESO		Х			
Actual:GRENWOOD-VERNON-E	NYISO	NYISO					
FARRGUT 1000MW WHEEL	NYISO	NYISO	Х				
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO					
NFG7105 - ADIRONDACK - IMO	NYISO	IESO					
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO					
Actual:E179 ST-HG 6	NYISO	NYISO					
Actual:HUDAVE E-JAMAICA	NYISO	NYISO					
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO					
Actual:DUN SO1R-E179 ST	NYISO	NYISO					
Actual:V STRM P-JAMAICA	NYISO	NYISO					
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO					
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO					
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO					

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corrido											
Constraint Name	To Area		El Rar	nkings		I	Regiona	l Rankin	g		Valı	
	Area		Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
APS South Interface	VAP	AP	1	50	98	38	1	2	7	3	403.14	5140
INTERFACE= PJM - WESTERN	AP	PJM500	3	60	101	100	2	3	8	8	263.26	4681
148 - Cloverdale-Lexington 5	VAP	AEP	4	84	74	34	3	6	5	2	256.93	3856
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	6	92	130	78	4	7	10	7	180.32	3643
461 - Mt. Storm-Doubs 500 (f	VAP	AP	7	153	168	62	5	14	12	6	171.05	2141
INTERFACE= PJM - CENTRAL	PJM500	PJM500	22	126	149	138	6	11	11	9	86.41	2731
1130 - Wylie Ridge 345/500 X	AP	AP	26	95	81	49	7	8	6	5	80.67	3604
1530 - Elrama-Mitchell 138 (	DLCO	AP	30	43	45	39	8	1	2	4	67.68	5241
78 - Black Oak-Bedington 500	AP	AP	68	99	223	193	10	9	13	12	25.28	3452
1386 - Oglesby-Mazon 138	NI	NI	82	127	124	21	11	12	9	1	20.48	2708
RAMAPO 1000MW WHEEL	PSEG	PSEG	144	70	13	167	12	4	1	10	8.06	4300
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	203	114	60	258	13	10	3	13	2.47	3119
130 - Cedar Grove-Clifton 23	PSEG	PSEG	322	131	69	342	14	13	4	14	0.19	2651

Table 3. Top Constraints, Ranks and Most Affected

															,
Constraint	Corridor				From hub	AEP_8_G	AP_1_County_Harrison _G	AP_1_County_Harrison _G	FE_9_MSA_Weirton_G	FE_9_MSA_Weirton_G	FE_9_MSA_Weirton_G	NYISO_3_NYC	NYISO_3_NYC	NYISO_6_NYF	PJM500_4_MSA_Phila delphia_G
Constraint Name	From	To Area	ues				A_Hagerst nsburg_L				A_Clevela	I\N_	8_MSA_New	MSA_New	_3_MSA_New
	Area		Bind Hrs	All-hrs Price	To Hub	AP_2_L	AP_7_MSA_Hagera own-Martinsburg_L	VAP_7_G	AEP_2_L	AP_2_L	FE_5_MSA nd_L	NYISO_9_NYI	PSEG_8_ York_G	PSEG_8_MSA_ York_G	PSEG_3_ York_L
APS South Interface	VAP	AP	1625	13.87											
INTERFACE= PJM - WESTERN	AP	PJM500	1535	4.93											
148 - Cloverdale-Lexington 5	VAP	AEP	2147	16.58											
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	1087	6.17				Х							
461 - Mt. Storm-Doubs 500 (f	VAP	AP	621	8.57											
INTERFACE= PJM - CENTRAL	PJM500	PJM500	772	2.17											
1130 - Wylie Ridge 345/500 X	AP	AP	1911	10.47					Х	Х	Х				
1530 - Elrama-Mitchell 138 (	DLCO	AP	3256	13.71		Х				Х					
78 - Black Oak-Bedington 500	AP	AP	209	1.03			Х	Х							
1386 - Oglesby-Mazon 138	NI	NI	1177	27.11											
RAMAPO 1000MW WHEEL	PSEG	PSEG	6166	0.92										Х	
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	2569	0.32	_							Х	Х		
130 - Cedar Grove-Clifton 23	PSEG	PSEG	2319	0.02										Х	Х

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor		PJM500_4_MSA_Phila delphia_G	PJM500_4_MSA_Phila delphia_G	PJM500_5_MSA_DC_ G	PJM500_9_MSA_Pittsb urgh_G	PJM500_9_MSA_Pittsb urgh_G	PJM500_9_MSA_Pittsb urgh_G	PJM500_9_MSA_Pittsb urgh_G	PL_8_MSA_Allentown_ G	VAP_1_MSA_Richmon d_G	VAP_1_MSA_Richmon d_G	VAP_7_G
Constraint Name	From Area	To Area	PSEG_8_MSA_New York_G	VAP_7_G	VAP_7_G	BGE_10_MSA_Balti more-Towson_L	BGE_5_MSA_Baltim ore-Towson_L	BGE_9_MSA_Baltim ore-Towson_L	PL_7_MSA_Allentow n_L	JCPL_1_MSA_New York_L	AP_7_MSA_Hagerst own-Martinsburg_L	VAP_7_G	AP_7_MSA_Hagerst own-Martinsburg_L
APS South Interface	VAP	AP											Х
INTERFACE= PJM - WESTERN	AP	PJM500				Х	Х	Х					
148 - Cloverdale-Lexington 5	VAP	AEP		Х	Х							Х	
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP		Х	Х								
461 - Mt. Storm-Doubs 500 (f	VAP	AP											Х
INTERFACE= PJM - CENTRAL	PJM500	PJM500				Х	Х	Х					
1130 - Wylie Ridge 345/500 X	AP	AP											
1530 - Elrama-Mitchell 138 (	DLCO	AP											
78 - Black Oak-Bedington 500	AP	AP									Х		
1386 - Oglesby-Mazon 138	NI	NI											
RAMAPO 1000MW WHEEL	PSEG	PSEG							Х	Х			
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	Х										
130 - Cedar Grove-Clifton 23	PSEG	PSEG	Х										

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor		VAP_7_G	VAP_7_G
Constraint Name	From Area	To Area	AP_8_MSA_DC-VA- MD_L	VAP_33_MSA_DC_ L
APS South Interface	VAP	AP	Х	Х
INTERFACE= PJM - WESTERN	AP	PJM500		
148 - Cloverdale-Lexington 5	VAP	AEP		
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP		
461 - Mt. Storm-Doubs 500 (f	VAP	AP	Х	Х
INTERFACE= PJM - CENTRAL	PJM500	PJM500		
1130 - Wylie Ridge 345/500 X	AP	AP		
1530 - Elrama-Mitchell 138 (	DLCO	AP		
78 - Black Oak-Bedington 500	AP	AP		
1386 - Oglesby-Mazon 138	NI	NI		
RAMAPO 1000MW WHEEL	PSEG	PSEG		
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG		
130 - Cedar Grove-Clifton 23	PSEG	PSEG		

Table 3. Top Constraints, Ranks and Most Affected Corridors

Table of Top Concultants, Itali			ī									
Constraint	Corridor											
Constraint Name	From	To Area		El Rai	nkings		i	Regional	Rankin	g		Val
Constraint Name	Area	10 Alea	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90
SPP 59-REDARCREDARC	OKGE	OKGE	5	38	35	32	1	5	4	11	194.26	5505
SPP 15-CREKILWICWOO	OKGE	WERE	10	68	40	1	2	9	5	1	149.28	4429
FG 5196 SPS North - South	SPS	SPS	11	8	15	18	3	1	1	8	149.00	7167
SPP 76-SUNXFRPITSEM	OKGE	OKGE	12	78	61	5	4	10	7	3	139.26	4050
1292 - Lake Road-Nashua 161	KACP	MIPU	19	45	33	3	5	6	3	2	100.55	5201
567 - Philips-S. Philips Jct	WERE	WERE	35	14	19	10	6	3	2	6	57.22	6717
SPP 13-CORCORSWSANA	AEPW	WFEC	38	56	77	9	7	8	11	5	53.45	4860
SPP118-STOMORLACNEO	SWPA	AECI	40	93	82	25	8	12	12	10	51.05	3630
SPP 52-OKMHENOKMKEL	AEPW	AEPW	48	82	72	6	9	11	9	4	43.94	3867
733 - Toledo Bend-Leesville	CELE	EES	50	104	85	16	10	13	13	7	37.55	3270
SPP111-SUMHE_BULSLD	SWPA	EES	58	110	62	23	11	14	8	9	30.14	3178
SPP109-SCOBONCOCVIL	LAFA	EES	74	130	131	46	12	16	15	12	23.38	2656
SPP 65-SABSEMPIRDIA	AEPW	AEPW	76	184	108	60	13	17	14	14	22.30	1743
SPP 27-EUFXFRWELXFR	SWPA	SWPA	141	233	211	58	14	18	16	13	8.49	1065
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	215	118	75	129	15	15	10	15	2.11	2929
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	253	55	42	168	16	7	6	16	1.24	4860
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	364	9	364	364	17	2	17	17	-	7162
FG 5204 SphWmcSumEmc	WERE	WERE	366	35	365	366	18	4	18	18	-	5713

Table 3. Top Constraints, Ranks and Most Affected

Constraint	Corridor		ues			AECI_4_G	AEPW_5_MSA _Tulsa_G	AEPW_9_MSA _MountPleasan t_G	AEPW_9_MSA _MountPleasan t_G	AEPW_9_MSA _MountPleasan t_G	CELE_10_MSA_Alexandria_G	EES_2_MSA_B atesville_G
Constraint Name	From		To Area			4_G	MSA_R le_G	MSA_B t- iur_G	MSA_R le_G	4_MSA_ naCity_	5_MSA_N eans_G	OKGE_4_MSA_ OklahomaCity_ L
Constraint Name	Area	TO Alea	Bind Hrs	All-hrs Price	To Hub	WERE_	EES_9_M ussellville	EES_7_MS. eaumont- PortArthur_	EES_9_M ussellville	OKGE_4_MSA OklahomaCity_ L	EES_5_MS/ ewOrleans_(	OKGE_4_MSA OklahomaCity_ L
SPP 59-REDARCREDARC	OKGE	OKGE	4107	18.51			Х	Х	Х			
SPP 15-CREKILWICWOO	OKGE	WERE	3561	101.15		Х						
FG 5196 SPS North - South	SPS	SPS	5965	28.27								
SPP 76-SUNXFRPITSEM	OKGE	OKGE	2568	48.04						Х		
1292 - Lake Road-Nashua 161	KACP	MIPU	4204	74.82								
567 - Philips-S. Philips Jct	WERE	WERE	5306	40.72								
SPP 13-CORCORSWSANA	AEPW	WFEC	2035	42.55								
SPP118-STOMORLACNEO	SWPA	AECI	1895	25.60								
SPP 52-OKMHENOKMKEL	AEPW	AEPW	2255	47.64								
733 - Toledo Bend-Leesville	CELE	EES	1879	28.89				Х				
SPP111-SUMHE_BULSLD	SWPA	EES	2528	25.80		Х						Х
SPP109-SCOBONCOCVIL	LAFA	EES	1078	11.83								
SPP 65-SABSEMPIRDIA	AEPW	AEPW	1391	8.85								
SPP 27-EUFXFRWELXFR	SWPA	SWPA	297	9.21								
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	2115	2.48								
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	3430	1.52							Х	
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	0	0.00								
FG 5204 SphWmcSumEmc	WERE	WERE	0	0.00								

Table 3. Top Constraints, Ranks and Most Affected

			ASA _G	ΛSΑ G	MSA G
Constraint	Corridor		WERE_1_MSA _Manhattan_G	WERE_1_MSA _Manhattan_G	WERE_1_MSA _Manhattan_G
Constraint Name	From Area	To Area	AEPW_1_MSA _Tulsa_G	OKGE_4_MSA_ OklahomaCity_ L	WERE_4_G
SPP 59-REDARCREDARC	OKGE	OKGE			
SPP 15-CREKILWICWOO	OKGE	WERE			
FG 5196 SPS North - South	SPS	SPS	Х	Х	
SPP 76-SUNXFRPITSEM	OKGE	OKGE			
1292 - Lake Road-Nashua 161	KACP	MIPU			
567 - Philips-S. Philips Jct	WERE	WERE			Х
SPP 13-CORCORSWSANA	AEPW	WFEC			
SPP118-STOMORLACNEO	SWPA	AECI	Х		
SPP 52-OKMHENOKMKEL	AEPW	AEPW			
733 - Toledo Bend-Leesville	CELE	EES			
SPP111-SUMHE_BULSLD	SWPA	EES			
SPP109-SCOBONCOCVIL	LAFA	EES			
SPP 65-SABSEMPIRDIA	AEPW	AEPW			
SPP 27-EUFXFRWELXFR	SWPA	SWPA			
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE			
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES			
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE			
FG 5204 SphWmcSumEmc	WERE	WERE			Х

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint		Corrid												
Constraint Name	From	To Aron		EI Ra	nkings	i	R	egiona	l Rank	ing		Val	ues	
Constraint Name	Area	To Area	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price
FN/FS INT	IESO	IESO	62	225	169	133	1	2	2	2	28.64	1265	612	2.33
East West Transfer West	IESO	IESO	69	67	47	64	2	1	1	1	23.90	4461	3190	8.37

Ontario	
These constraints affect no corridors	

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corrid	or												
Constraint Name	From	To Area		EI Ra	anking	s	Re	egiona	l Rank	king		Valu	ıes	
Constraint Name	Area		Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	89	145	87	59	1	2	2	2	18.00	2312	1827	9.15
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	91	117	76	43	2	1	1	1	17.45	2988	2090	12.98
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	138	155	113	63	3	3	3	3	8.94	2133	1368	8.48

VACAR	
These constraints affect no corridors	ct

**Table 3. Top Constraints, Ranks and Most Affected Corridors** 

Constraint	Corrid	lor												
Constraint Name	From	To Area		EI Ra	anking	s	Re	egiona	ıl Rank	king		Val	ues	
Constraint Name	Area	To Area	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	103	113	107	66	1	1	1	1	14.39	3131	1415	7.95

_			
	١.	•	Λ
	١ ١	,	н

These constraints affect no corridors

Table 3. Top Constraints, Ranks and Values

Constrain	ts						Corri	dors				
						ues						
Constraint Name	From Area	To Area	From Marke	To Market								
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price
1-TRIPS,8ELDEHV -3ELDEHV - 1	EES	EES	ENTERGY	ENTERGY	71	180	160	85	23.6	1764	687	6.00
NFG1314 - Little Gypsy-South	EES	EES	ENTERGY	ENTERGY	27	83	111	36	75.0	3863	1372	14.98
FG 1376 Coly-Vignes for the	LAGN	EES	ENTERGY	ENTERGY	16	20	30	22	107.2	6308	4408	26.42
SPP 93-WNE_WKS	NPPD	NPPD	MAPP	MAPP	17	4	7	15	107.1	7724	6821	30.09
1343 - Detroit Industrial-Wa	ITC	ITC	MISO	MISO	289	105	63	317	0.6	3238	2503	0.08
19BUNCE 230-SCOTT 220- 1	ITC	IESO	MISO	ONTARIO	345	28	17	348	0.1	6014	5637	0.02
884 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	36	37	64	13	55.7	5592	2483	33.21
249 - ATC Flow South	WEC	WPS	MISO	MISO	158	121	67	118	6.1	2849	2368	3.17
SPP 69-SPPSPSTIES	WEPL	SPS	MISO	SPP	46	48	23	48	44.8	5176	4915	10.48
2TRIP Norwalk H-Northport	NEPOOL	NEPOOL	NEPOOL	NEPOOL	104	10	10	92	14.1	6972	6423	5.58
North New England Scobie Low	NEPOOL	NEPOOL	NEPOOL	NEPOOL	32	18	16	88	59.9	6647	5840	5.93
W Rutland Tap - Blissvile 11	NEPOOL	NEPOOL	NEPOOL	NEPOOL	234	13	8	196	1.7	6732	6555	1.02
14 I/F WEST CENTRAL OP LO	NYISO	NYISO	NYPP	NYPP	41	12	12	95	50.3	6791	6196	5.21
1TRIP Leeds-Pleasant Val HI	NYISO	NYISO	NYPP	NYPP	9	49	43	45	163.5	5160	3340	12.11
7 I/F CENTRAL EAST LO	NYISO	NYISO	NYPP	NYPP	43	57	56	145	47.8	4803	2742	2.07
7 I/F MOSES SOUTH CLOSE LO	NYISO	NYISO	NYPP	NYPP	25	27	18	71	81.0	6039	5343	7.09
7 I/F MOSES SOUTH OPEN HI	NYISO	NYISO	NYPP	NYPP	114	80	86	220	11.9	3967	1879	0.72
CP10_12_1-tips, ReacBus-Dvnp	NYISO	NYISO	NYPP	NYPP	79	2	2	127	21.9	8676	8533	2.63
CP10_20_E179St_Hg4_E179St_Hg	NYISO	NYISO	NYPP	NYPP	187	32	39	161	3.5	5737	3583	1.62
FARRGUT 1000MW WHEEL	NYISO	NYISO	NYPP	NYPP	112	53	6	134	12.1	5060	6903	1.37

Table 3. Top Constraints, Ranks and Values

Constrai	nts						Corri	dors						
	1	ı	1											
Constraint Name	From Area	To Area	From Mark	To Market		Rank	kings			Values				
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price		
NFG7010 - IMO - ADIRONDACK	NYISO	IESO	NYPP	ONTARIO	88	7	5	76	18.3	7200	6966	6.21		
1130 - Wylie Ridge 345/500 X	AP	AP	PJM	PJM	26	95	81	49	80.7	3604	1911	10.47		
78 - Black Oak-Bedington 500	AP	AP	PJM	PJM	68	99	223	193	25.3	3452	209	1.03		
INTERFACE= PJM - WESTERN	AP	PJM500	PJM	PJM	3	60	101	100	263.3	4681	1535	4.93		
11 I/F UPNY - SENY OPEN LO	NYISO	NYISO	NYPP	NYPP	34	54	54	169	58.8	4952	2919	1.50		
RAMAPO 1000MW WHEEL	PSEG	PSEG	PJM	PJM	144	70	13	167	8.1	4300	6166	0.92		
148 - Cloverdale-Lexington 5	VAP	AEP	PJM	PJM	4	84	74	34	256.9	3856	2147	16.58		
APS South Interface	VAP	AP	PJM	PJM	1	50	98	38	403.1	5140	1625	13.87		
SPP 59-REDARCREDARC	OKGE	OKGE	SPP	SPP	5	38	35	32	194.3	5505	4107	18.51		
SPP 76-SUNXFRPITSEM	OKGE	OKGE	SPP	SPP	12	78	61	5	139.3	4050	2568	48.04		
FG 5196 SPS North - South	SPS	SPS	SPP	SPP	11	8	15	18	149.0	7167	5965	28.27		
SPP111-SUMHE_BULSLD	SWPA	EES	SPP	ENTERGY	58	110	62	23	30.1	3178	2528	25.80		
SOUTHERN - GRIDFLORIDA	FPL	SOCO	FRCC	SOUTHERN	15	102	70	111	113.35	3355	2300	3.58		
1-TRIPS,7THOMHL -5THMHIL - 1	AECI	AECI	ENTERGY	ENTERGY	20	6	4	28	99.0	7354	7326	20.24		
1-TRIPS,3BVRCRK -3STAND -99	EES	EES	ENTERGY	ENTERGY	281	76	58	195	0.7	4088	2653	1.03		
1-TRIPS,3CAMDMG -3MCNEIL -99	EES	EES	ENTERGY	ENTERGY	228	101	83	140	1.8	3385	1884	2.14		
1-TRIPS,4ALCAEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	111	22	24	81	12.1	6239	4894	6.11		
1-TRIPS,4ALCBEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	110	21	22	79	12.2	6288	4934	6.16		
1-TRIPS,4ALCCEM -4MONOCM1- 1	EES	EES	ENTERGY	ENTERGY	115	26	27	87	11.8	6083	4784	5.95		
FG 1308 Dodson-Danville_Hart	EES	EES	ENTERGY	ENTERGY	154	31	26	83	6.4	5742	4790	6.06		
FG 1324 WhiteBluff-Sheridan	EES	EES	ENTERGY	ENTERGY	59	164	144	149	30.1	1977	858	1.98		

Table 3. Top Constraints, Ranks and Values

Constrai	nts						Corri	dors						
	_		_							_				
Constraint Name	From Area	To Area	From Marke	To Market		Rani	kings		Values					
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price		
FG 1379 Grimes-Mt Zion for t	EES	EES	ENTERGY	ENTERGY	72	1	1	42	23.6	8719	8622	13.04		
FG 1380 Batesville-Marks for	EES	EES	ENTERGY	ENTERGY	171	40	28	77	4.7	5417	4777	6.18		
NFG1350 - North Crowley-Scot	LAGN	EES	ENTERGY	ENTERGY	45	98	106	26	46.3	3471	1437	24.41		
1-TRIPS,FT MEADE-FT MEADE- 1	FPC	FPC	FRCC	FRCC	136	120	122	72	9.0	2853	1184	6.80		
1-TRIPS,NORMBNDY-NORMAN_A- 2	JEA	JEA	FRCC	FRCC	106	161	114	70	12.5	2027	1327	7.12		
901 - Galesburg 161/138 Xfm	MEC	IP	MAPP	MISO	65	108	88	14	26.5	3207	1813	30.14		
1441 - Grand Island-Aurora 1	NPPD	NPPD	MAPP	MAPP	37	74	36	7	55.0	4125	3842	45.73		
1-TRIPS,FTPECK 4-FTPECK 7- 1	WAPA	WAPA	MAPP	MAPP	159	109	49	51	6.1	3184	3183	10.37		
519 - Northpoint-Dewey 115 (	ALTE	WPS	MISO	MISO	63	44	29	12	27.7	5212	4707	33.97		
679 - Spencer-Triboji 161 (f	ALTW	WAPA	MISO	MAPP	61	159	120	33	29.5	2091	1192	17.24		
553 - Pana 345/138 Xfm (flo)	AMRN	AMRN	MISO	MISO	47	122	119	44	44.2	2834	1265	12.57		
GRANITF4 230-WILLMAR4 230- 1	GRE	WAPA	MISO	MAPP	33	206	147	19	59.1	1427	827	28.17		
NFG2081 - 10NEWTNV69.0 07MID	HE	SIGE	MISO	MISO	235	316	294	91	1.7	329	71	5.59		
1196 - Smith-Green River Ste	LGEE	LGEE	MISO	MISO	78	30	41	56	22.0	5799	3519	9.51		
1204 - Farr RDJ-Tippy 138 (f	METC	METC	MISO	MISO	126	185	126	74	10.1	1742	1128	6.37		
1-TRIPS,ARROWHD4-RUSH CY4- 1	MP	MP	MISO	MISO	42	69	50	35	48.1	4411	3151	16.48		
1-TRIPS,RIVERTN4-BLCKBRY4- 1	MP	MP	MISO	MISO	57	61	71	54	30.5	4671	2299	9.64		
SLVRBYH7 115 TWO HBR7 115	MP	MP	MISO	MISO	177	59	31	103	4.1	4745	4386	4.75		
WNTR ST7 115 HIBBARD7 115	MP	MP	MISO	MISO	129	51	21	75	10.0	5112	5001	6.23		
1162 - Dune Acres-Michigan C	NIPS	NIPS	MISO	MISO	14	62	66	4	116.7	4585	2434	69.57		

Table 3. Top Constraints, Ranks and Values

Constrai	nts						Corri	dors							
Constraint Name	From Area	To Area	From Marke	To Market	Rankings					Values					
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price			
1203 - Leesburg-Northeast 13	NIPS	NIPS	MISO	MISO	8	52	80	2	164.5	5109	1959	84.36			
1-TRIPS,MORRIS 7-GRACEVT7- 1	OTP	WAPA	MISO	MAPP	216	77	184	128	2.1	4085	450	2.52			
1-TRIPS,ORTONVL7-GRACEVT7- 1	OTP	OTP	MISO	MISO	80	47	32	24	21.8	5188	4250	25.80			
1272 - Oak Creek 345/230 Xfm	WEC	WEC	MISO	MISO	66	39	52	53	26.0	5452	3126	9.86			
1509 - Bain-Kenosha 138 (flo	WEC	WEC	MISO	MISO	28	66	51	17	72.7	4476	3130	28.82			
Petersburg 345/138 Xfm E	IPL	IPL	MISO	MISO	87	247	187	37	18.4	862	438	13.93			
876 - Cranberry Loop 115kV	WPS	WPS	MISO	MISO	52	209	215	31	34.8	1417	252	18.89			
1253 - Genoa-Coulee 161 (flo	XEL	DPC	MISO	MISO	97	232	189	69	15.4	1092	432	7.30			
MINVALY7 115-MINVALT4 230- 1	XEL	XEL	MISO	MISO	109	100	68	20	12.4	3440	2321	28.12			
1-TRIPS,GRAND IS-S HERO - 1	NEPOOL	NEPOOL	NEPOOL	NEPOOL	223	96	48	205	1.9	3571	3186	0.91			
Actual:HUDAVE E-JAMAICA	NYISO	NYISO	NYPP	NYPP	137	15	9	67	8.94272	6699	6503	7.89201			
14 I/F WEST CENTRAL OP HI	NYISO	NYISO	NYPP	NYPP	31	19	53	82	62.7	6461	3056	6.08			
1TRIP Dun-ShoreRd SpBrk-EGC	NYISO	NYISO	NYPP	NYPP	67	5	3	120	25.4	7721	7466	3.13			
1TRIP Reynld-GBush NScot-Alp	NYISO	NYISO	NYPP	NYPP	70	25	20	40	23.7	6089	5246	13.69			
1TSPBKTRMT:DUN NO1R-S CREEK	NYISO	NYISO	NYPP	NYPP	371	86	371	371	0.0	3799	0	0.00			
1TSPBKTRMT:DUN NO2R-S CREEK	NYISO	NYISO	NYPP	NYPP	368	64	370	368	0.0	4487	0	0.00			
7 I/F MOSES SOUTH CLOSE HI	NYISO	NYISO	NYPP	NYPP	2	73	44	30	282.3	4148	3259	18.91			
Actual:DUN SO1R-E179 ST	NYISO	NYISO	NYPP	NYPP	357	3	180	356	0.0	7745	495	0.00			
Actual:E179 ST-HG 6	NYISO	NYISO	NYPP	NYPP	130	136	92	97	9.9	2474	1765	5.07			
Actual:FR-KILLS-WILOWBK2	NYISO	NYISO	NYPP	NYPP	85	58	38	41	19.8	4746	3678	13.32			
Actual:GOWNUS1R-GRENWOOD	NYISO	NYISO	NYPP	NYPP	123	89	146	93	10.5	3731	837	5.27			

Table 3. Top Constraints, Ranks and Values

Constrain	ts						Corri	dors				
		<u> </u>	I	<u> </u>								
Constraint Name	From Area	To Area	Rankings Values rea From Marke To Market									
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price
Actual:GRENWOOD-VERNON-E	NYISO	NYISO	NYPP	NYPP	100	124	73	52	14.8	2803	2194	9.94
1-TRIPS,HMP HRBR-DVNPT NK- 1	NYISO	NYISO	NYPP	NYPP	372	94	373	372	0.0	3616	0	0.00
Actual:V STRM P-JAMAICA	NYISO	NYISO	NYPP	NYPP	360	65	34	358	0.0	4480	4166	0.00
NFG7105 - ADIRONDACK - IMO	NYISO	IESO	NYPP	ONTARIO	117	17	11	98	11.5	6670	6359	5.05
East West Transfer West	IESO	IESO	ONTARIO	ONTARIO	69	67	47	64	23.9	4461	3190	8.37
FN/FS INT	IESO	IESO	ONTARIO	ONTARIO	62	225	169	133	28.6	1265	612	2.33
ONTARIO-NEW YORK ST LAW INT	IESO	NYISO	ONTARIO	NYPP	365	23	366	365	0.0	6232	0	0.00
1530 - Elrama-Mitchell 138 (	DLCO	AP	PJM	PJM	30	43	45	39	67.7	5241	3256	13.71
1386 - Oglesby-Mazon 138	NI	NI	PJM	PJM	82	127	124	21	20.5	2708	1177	27.11
11 I/F UPNY - SENY CLOSE LO	NYISO	NYISO	NYPP	NYPP	44	116	117	191	46.3	3078	1294	1.04
INTERFACE= PJM - CENTRAL	PJM500	PJM500	PJM	PJM	22	126	149	138	86.4	2731	772	2.17
130 - Cedar Grove-Clifton 23	PSEG	PSEG	PJM	PJM	322	131	69	342	0.2	2651	2319	0.02
NFG 23 - Roseland-Cedar Gro	PSEG	PSEG	PJM	PJM	203	114	60	258	2.5	3119	2569	0.32
1-TRIPS,8MT STM -01PRNTY - 1	VAP	AP	PJM	PJM	6	92	130	78	180.3	3643	1087	6.17
461 - Mt. Storm-Doubs 500 (f	VAP	AP	PJM	PJM	7	153	168	62	171.0	2141	621	8.57
SPP 13-CORCORSWSANA	AEPW	WFEC	SPP	SPP	38	56	77	9	53.4	4860	2035	42.55
SPP 52-OKMHENOKMKEL	AEPW	AEPW	SPP	SPP	48	82	72	6	43.9	3867	2255	47.64
SPP 65-SABSEMPIRDIA	AEPW	AEPW	SPP	SPP	76	184	108	60	22.3	1743	1391	8.85
1-TRIPS,BC PST 4-3BVRCRK - 1	CELE	EES	SPP	ENTERGY	253	55	42	168	1.2	4860	3430	1.52
1-TRIPS,DOLHILL6-DOLHILL7- 1	CELE	CELE	SPP	SPP	364	9	364	364	0.0	7162	0	0.00

Table 3. Top Constraints, Ranks and Values

Constrain	ts						Corri	dors						
Contain														
Constraint Name	From Area	To Area	From Marke	To Market	Rankings larket					Values				
					Cong Rent	U90	Bind Hrs	All-hrs Price	Cong Rent (M\$)	U90	Bind Hrs	All-hrs Price		
733 - Toledo Bend-Leesville	CELE	EES	SPP	ENTERGY	50	104	85	16	37.6	3270	1879	28.89		
1292 - Lake Road-Nashua 161	KACP	MIPU	SPP	MISO	19	45	33	3	100.6	5201	4204	74.82		
SPP109-SCOBONCOCVIL	LAFA	EES	SPP	ENTERGY	74	130	131	46	23.4	2656	1078	11.83		
SPP 15-CREKILWICWOO	OKGE	WERE	SPP	SPP	10	68	40	1	149.3	4429	3561	101.15		
SPP 27-EUFXFRWELXFR	SWPA	SWPA	SPP	SPP	141	233	211	58	8.5	1065	297	9.21		
SPP118-STOMORLACNEO	SWPA	AECI	SPP	ENTERGY	40	93	82	25	51.1	3630	1895	25.60		
1-TRIPS,166TH 3-JARBALO3- 1	WERE	WERE	SPP	SPP	215	118	75	129	2.1	2929	2115	2.48		
567 - Philips-S. Philips Jct	WERE	WERE	SPP	SPP	35	14	19	10	57.2	6717	5306	40.72		
FG 5204 SphWmcSumEmc	WERE	WERE	SPP	SPP	366	35	365	366	0.0	5713	0	0.00		
1-TRIPS,5OGLETHR-5WIDCRK2- 1	TVA	TVA	TVAUTHOR	TVAUTHOR	103	113	107	66	14.4	3131	1415	7.95		
1-TRIPS,6GRANITE-3GRANITE- 2	SCEG	SCEG	VACAR	VACAR	89	145	87	59	18.0	2312	1827	9.15		
NFG1801 - 3Lyles-3Lexngt 115	SCEG	SCPSA	VACAR	VACAR	91	117	76	43	17.4	2988	2090	12.98		
1-TRIPS,6BLUFFTN-3BLUFFTN-2	SCPSA	SCPSA	VACAR	VACAR	138	155	113	63	8.9	2133	1368	8.48		



# Memorandum

To: Poonum Agrawal, David Meyer, U.S. Department of

CRA No. D08554-00

Energy

From: Prashant Murti, Alex Rudkevich, CRA International

Date: Finalized March 13, 2006

Subject: GE MAPS INPUT ASSUMPTIONS: EASTERN INTERCONNECT

This memorandum summarizes salient inputs to the CRA locational price forecasting model (GE MAPS). The model geographic footprint encompasses the US portion of the Eastern Interconnect and the Canadian province of Ontario. The analyses simulate the years 2008 and 2011.

Primary data sources for the CRA GE MAPS model include the NERC MMWG, the General Electric generation and transmission databases for the Eastern Interconnect, various publications by NERC regions and Independent System Operators, FERC submissions by generation and transmission owners, and CRA in-house analysis of plant operations and market data. Major data components are listed below.

ı.	1 ransmission	
	Load and Energy	
	Thermal Units	
4.	Nuclear Units	4
5.	Hydro Units	4
6.	Renewable resources	5
7.	Capacity Additions and Retirements	5
8.	Fuel Price Forecasts	6
9.	Environmental Regulations	6
10.	External Region Supply	6
11.	Interruptible Load	7
12.	Market Model Assumptions	7
	endix I: Capacity Balance	

#### 1. TRANSMISSION

The CRA model is based on load flow cases provided by the NERC Multiregional Modeling Working Group (MMWG). This analysis uses the MMWG 2005 series load flow cases for the summer of 2007 and the summer of 2010. The load flow cases encompass the entire Eastern Interconnect system, including lines, transformers, phase shifters, and DC ties. The Cross-Sound and Neptune high voltage DC cables are added to these cases. Apart from these DC cables, no transmission upgrades are added apart from those included in the MMWG cases. Monitored constraints originate in the following sources:

- The NERC flowgate book.
- The list of flowgates published by the Midwest ISO on their website.
- A list of flowgates provided by the Southwest Power Pool.
- FERC Form 715 filings, seasonal transmission assessment reports, and studies published by NERC regions and Independent System Operators.
- Regional Transmission Expansion Plan (RTEP) reports published by various ISO.
- The 2004 Intermediate Area Transmission Review published by the New York ISO.
- The CP-10 Working Group report (2004) by the Northeast Power Coordinating Council.
- Contingency analyses performed by General Electric and by CRA.
- Historically binding constraints monitored by CRA.

#### 2. LOAD AND ENERGY

For each load serving entity GE MAPS requires an hourly load shape and an annual forecast of peak load and total energy. Loads for forecast years are scaled based on these parameters. Load shapes are drawn from hourly actual demand for 2002, as published in FERC Form 714 submissions and on the websites of various Independent System Operators (ISOs) and NERC reliability regions. Peak load and annual energy forecasts are taken from the most recent data available in FERC Form 714 submissions (2004) and from forecast reports published by ISOs and NERC regions (2005), including:

- Forecast of Capacity Energy Load and Transmission (CELT), 2005 by the ISO New England.
- 2005 Load and Capacity Data report (Gold Book) published by the NYISO.
- 2005 PJM Load Forecast Report published by PJM.

Ontario data is drawn from the 10-Year Outlook: Ontario Demand Report published by the Independent Electricity Market Operator of Ontario

#### 3. THERMAL UNITS

GE MAPS includes a detailed model of thermal generation, in order to accurately simulate operational characteristics, and project realistic hourly dispatch and prices. Modeled characteristics include unit type, unit fuel type, heat rate values and shape (based on unit technology), summer and winter capacities, fixed and variable non-fuel operation and maintenance costs, startup fuel usage, forced and planned outage rates, minimum up and down times, and quick start and spinning reserve capabilities.

The CRA generation database reflects unit-specific data for each generating unit based on a wide variety of sources. In cases where unit-specific data is not available, representative values based on unit type, fuel, and size are used. Table 1 and Table 2 document these generic assumptions. Note that all costs and prices are shown in real 2005 dollars.

Unit Type & Size	Variable O&M (\$/MWh)		O&M O&M		Minimum Downtime (Hrs)	Minimum Uptime (Hrs)	Heat Rate Shape
Combined Cycle	\$	2.50	\$ 21.00	8	6	2 Blocks, each 50% at FLHR	
Combustion Turbine <100 MW	\$	7.00	\$ 15.00	1	1	One block	
Combustion Turbine >100 MW	\$	7.00	\$ 15.00	1	1	One block	
Steam Turbine [coal] >200 MW	\$	1.00	\$ 35.00	12	24	4 blocks, 50% @	
Steam Turbine [coal] <100 MW	\$	3.00	\$ 45.00	6	8	106%FLHR, 15% @ 90%,	
Steam Turbine [coal] <200 MW	\$	3.00	\$ 35.00	8	8	30% @ 95%, 5% @ 100%	
Steam Turbine [gas] >200 MW	\$	3.00	\$ 30.00	8	16	4 blocks, 25% @	
Steam Turbine [gas] <100 MW	\$	5.00	\$ 34.00	6	10	118%FLHR, 30% @ 90%,	
Steam Turbine [gas] <200 MW	\$	4.00	\$ 30.00	6	10	35% @ 95%, 5% @ 103%	
Steam Turbine [oil] >200 MW	\$	3.00	\$ 30.00	8	16	4 blocks, 25% @	
Steam Turbine [oil] <100 MW	\$	5.00	\$ 34.00	6	10	118%FLHR, 30% @ 90%,	
Steam Turbine [oil] <200 MW	\$	4.00	\$ 30.00	6	10	35% @ 95%, 5% @ 103%	

**Table 1: Generic Unit Characteristics** 

The primary data source for generation units and characteristics is the NERC Electricity, Supply and Demand (ES&D) 2003 database, which contains unit type, fuel type (primary and secondary), and capacity data for existing units. Heat rate data is drawn from prior ES&D databases where available. For newer plants, heat rates are based on industry averages for the technology of the unit. The NERC Generation Availability Data System (GADS) 2003 database, released January 2005, is the source for forced and planned outage rates, based on plant type, size, and vintage. Fixed and variable operation and maintenance costs are estimates based on plant size, technology, and age. These estimates are supplemented by FERC Form 1 submissions where available. The FOM values include an estimate of \$1.50/kW-yr for insurance and 10% of base FOM (before insurance) for capital improvements.

Plants that are known to be cogeneration facilities are either modeled with a low heat rate (6000 Btu/kWh), or set as must-run units in the dispatch, to reflect the fact that steam demand requires operation of the plant even when uneconomical in the electricity market.

**Table 2: Generic Unit Characteristics** 

Unit Type & Size	Quick Start (% of Capacity)	Spinning Reserve (% of Capacity)	Forced Outage Rate (%)	Planned Outage Rate (%)	Typical Outage Length (Days)
Combined Cycle	-	30%	1.81%	7.40%	3
Combustion Turbine <100 MW	100%	90%	2.81%	5.28%	1
Combustion Turbine >100 MW	100%	90%	2.60%	6.94%	1
Steam Turbine [coal] >200 MW	-	10%	3.07%	9.10%	7
Steam Turbine [coal] <100 MW	-	10%	3.78%	8.32%	3
Steam Turbine [coal] <200 MW	-	10%	4.57%	9.43%	3
Steam Turbine [gas] >200 MW	-	10%	3.50%	14.11%	7
Steam Turbine [gas] <100 MW	-	10%	2.62%	6.81%	2
Steam Turbine [gas] <200 MW	-	10%	3.23%	11.11%	2
Steam Turbine [oil] >200 MW	-	10%	2.79%	13.51%	7
Steam Turbine [oil] <100 MW	-	10%	1.46%	8.33%	2
Steam Turbine [oil] <200 MW	-	10%	3.01%	12.16%	2

#### 4. NUCLEAR UNITS

CRA assumes that nuclear plants run when available, and that they have minimum up and down times of one week. Forced outage rates for each unit are drawn from the Energy Central database of unit outages. Nuclear plants do not contribute to quick-start or spinning reserves. The model includes refueling and maintenance outages for each nuclear plant. In the near future, outages posted on the NRC website or announced in the trade press are included. For later years, refueling outages are projected on the basis of the refueling cycle, typical outage length, and last known outage dates of each plant. Since these facilities are treated as must run units, CRA does not specifically model their cost structure. Within the timeframe of this study, no nuclear retirements are applied.

#### 5. HYDRO UNITS

GE MAPS has special provisions for modeling hydro units. For conventional or pondage units, a monthly pattern of water flow, i.e. the minimum and maximum generating capability and the total energy for each plant in each month is specified. For pumped storage units, the maximum generating & pumping capability of the plant is specified. For both types of hydro resource, CRA assumes that the plant is able to provide spinning reserves of up to 50% of plant capacity. Plant capacity data is drawn from the NERC ES&D database and the General Electric generating unit database. Plant monthly energy data is drawn from an average of Form EIA-860 submissions for 1992-1998.

#### 6. RENEWABLE RESOURCES

It is difficult to predict exact operational patterns of wind and solar generators, since these are dependent on weather and ambient conditions. Therefore they are modeled as non-dispatchable resources with a specified annual capacity factor. Wind resources are modeled at 30% annual capacity factor, while solar generators are run at 24% annual capacity factor, and restricted to daytime hours.

#### 7. CAPACITY ADDITIONS AND RETIREMENTS

CRA adds new generation based on projects in development or advanced stages of permitting, as indicated by trade press announcements, trade publications, environmental permit applications, and internal knowledge. CRA also adds generic capacity where economically justified, or as required to maintain resource adequacy per installed capacity reserve margins published by various ISOs and NERC regions.

Future new entry is likely to be in the form of gas-fired simple cycle (SCGT) or combined cycle (CCGT) units, depending on local needs and price patterns. In 2011, coal-fired steam turbine units may also be a viable option. Table 3 shows financing assumptions for each of these categories. The associated annual carrying cost amounts to approximately 94 \$/kW-yr for CCGT units, 65 \$/kW-yr for SCGT units, and 180 \$/kW-yr for coal-fired units.

**Table 3: New Entry Financing** 

Cost Component	CCGT	SCGT	ST Coal
All-In Capital Cost (\$/kW)	650	400	1,500
Debt-Equity Ratio	55:45	50:50	50:50
Return on Equity	18%	18%	12%
Cost of Debt	8%	8%	8%
Term of Debt (years)	30	20	30
Fixed O&M (\$/kW-yr)	20	10	25
Variable O&M (\$/MWh)	2.5	5.0	1.0
Full Load Heat Rate (Btu/kWh)	6,900	10,000	9,000
Forced Outage Rate	3%	4%	4%
Planned Outage Rate	5%	5%	9%

CRA tracks planned and announced retirements from power pool load and capacity reports, as well as trade press announcements. A capacity balance for each NERC region is shown in Appendix I.

#### 8. FUEL PRICE FORECASTS

GE-MAPS uses a monthly fuel price for each thermal unit. The fundamental assumption of behavior in competitive markets is that generators will bid their marginal cost into the energy market. The marginal cost for a gas plant is the opportunity cost of fuel purchased (in addition to non-fuel variable O&M and environmental adders), or the spot price of gas at the location closest to the plant. CRA therefore uses forecasts of spot prices at regional hubs, and refines these on the basis of historical differentials between price points and their associated hubs. For fuel oil CRA uses estimates of the price delivered to generators on a regional basis.

A number of generators can utilize a secondary fuel type. This possibility is simulated as follows:

- Natural Gas Primary: Units that primarily burn natural gas typically face stringent restrictions on the fraction of time that they may burn fuel oil. CRA makes the assumption that each unit is allowed to switch to fuel oil for the one month in each year in which the gas prices are highest.
- Fuel Oil Primary: Units that primarily burn oil may switch to gas whenever it is economically
  justified. However CRA assumes that natural gas shortages prevent this from happening in winter
  (November though March). A heat rate degradation of 3% is modeled when the unit switches to
  natural gas. Thus, the fuel type is switched between April and October, whenever the price of
  natural gas plus 3% is less than the price of fuel oil.

Coal prices are drawn from the Platts Coaldat database of January 2005, which forecasts delivered coal prices, including transportation and handling, for each major coal plant in the United States.

CRA has sent you a separate memorandum with a detailed description of natural gas and oil forecasts.

#### 9. ENVIRONMENTAL REGULATIONS

CRA models NOx and SO<sub>2</sub> emission rates for all units where such data is available. In addition, CRA models compliance with various allowance trading programs, and attempts to capture the effect of future environmental regulations. All plant emission rates are drawn from the Emissions Scorecard published by the US Environmental Protection Agency. Emission rates for NOx and SO<sub>2</sub> are obtained from industry futures, in particular those published by the Cantor Environmental Brokerage. In this analysis CRA uses allowance trading prices based on futures for the 2008 simulations. For the 2011 simulations, CRA uses the allowance price forecast applied by the Energy Information Administration in developing the 2006 Annual Energy Outlook. CRA does not include the impacts of Carbon or Mercury emissions in these simulations.

#### 10. EXTERNAL REGION SUPPLY

CRA explicitly models the US portion of the Eastern Interconnect, and the Canadian province of Ontario. Regions outside this study area are modeled as either supply profiles or scheduled interchanges. CRA

uses historic flows, combined with expectations of future conditions in these areas to project quantities and prices of power exchanged with the model footprint. In this analysis, flows from New Brunswick to New England, and from Hydro Quebec to New England, New York, and Ontario are modeled as scheduled flows, based on 12 months of historical data.

The DC ties with the WECC and ERCOT interconnections are modeled as price sensitive supply curves. CRA uses historical electricity prices and gas prices near these DC ties to calculate market heat rates for on-peak and off-peak periods, and for summer and winter. These heat rates are multiplied by the appropriate forecast gas price in each scenario, to arrive at a price points for each DC tie. The tie is then modeled as follows:

- When the locational price at the DC tie is within ± \$2.50/MWh of the corresponding price point, zero flow is assumed on the tie.
- At locational prices that are between \$2.50/MWh and \$7.50/MWh above the price point, the tie is modeled as importing power into the Eastern Interconnect at half its capacity.
- At locational prices that are greater than \$7.50/MWh above the price point, the tie is modeled as importing power into the Eastern Interconnect at full capacity.
- At locational prices that are between \$2.50/MWh and \$7.50/MWh below the price point, the tie is modeled as exporting power from the Eastern Interconnect at half its capacity.
- At locational prices that are greater than \$7.50/MWh below the price point, the tie is modeled as
  exporting power from the Eastern Interconnect at full capacity.

#### 11. INTERRUPTIBLE LOAD

The presence of demand response is important to energy and installed capacity prices. The value of energy to interruptible loads caps the energy prices, and the capacity of interruptible load effectively replaces installed reserves and lowers the capacity value. CRA uses values for interruptible load, and demand side management reduction in peak, as reported by the various Independent System Operators and reliability regions in the EIA-411 and other equivalent annual forecasts. This dispatchable demand is spread among load areas based on their load share of the total system load (unless there is more detailed data available). The dispatchable demand is implemented as generators with a dispatch price of \$600/MWh for the first block (50% of area dispatchable demand) and \$800/Mwh for the second block. These units rarely run, as the high prices they require indicate a supply shortfall and prompt economic new entry. Thus dispatchable demand plays an insignificant direct role in the energy market.

#### 12. MARKET MODEL ASSUMPTIONS

A. **Marginal Cost Bidding:** All generation units are assumed to bid marginal cost (opportunity cost of fuel plus non-fuel VOM plus opportunity cost of tradable permits). It is reasonable to assume that the real markets are not perfectly competitive and thus the model tends to underestimate the prices in the real markets.

B. **Installed Capacity:** Installed capacity reserve requirements are set at a percentage of forecast peak load for each NERC region or sub-region, as shown in Table 4. CRA adds capacity to ensure that each region meets the installed capacity target indicated by these requirements.

**Table 4: Installed Capacity (% of Peak Load)** 

Pool	Fraction
NEPOOL	115%
NYPP	118%
Long Island	99%
New York City	80%
MAAC	116%
ECAR	115%
MAIN	117%
MAPP	115%
SPP	115%
Entergy	115%
Southern	115%
TVA	115%
VACAR	115%
FRCC	118%
Ontario	118%

C. **ISO Boundaries:** CRA uses hurdle rates for all flows (transactions) between various ISOs. These hurdle rates simulate both existing wheeling rates and market inefficiencies associated with inter-ISO transactions. All hurdle rates are set at \$2/MWh in each direction in both commitment and dispatch, except as documented in Table 5.

Table 5: Hurdle Rates (\$/MWh Flow)

From	То	Commitment	Dispatch
ISO-NE	NYISO	\$6	\$4
NYISO	ISO-NE	\$8	\$6
PJM	NYISO	\$4	\$1
NYISO	PJM	\$6	\$6
ONTARIO	NYISO	\$3	\$1
NYISO	ONTARIO	\$6	\$3
PJM	MISO	\$0	\$0
MISO	PJM	\$0	\$0

D. Operating Reserves: Operating reserves are based on requirements instituted by each reliability region. These requirements are based on the loss of the largest single generator, or the largest single generator and half the second largest generator, or a percentage of peak demand. The spinning reserves market affects energy prices, since units that spin cannot produce electricity under normal conditions. Energy prices are higher when reserves markets are modeled. Table 6 shows a list of operating reserves by reliability region, and the fraction met by spinning reserves. The remainder is assumed to be met by quick start reserves.

**Table 6: Operating Reserve Requirements** 

ISO/Region	Operating Reserve	% Met by Spin
ISO-NE	1,900 MW	67%
NYISO	1,200 MW	50%
Eastern NY	1,200 MW	25%
Long Island	120 MW	50%
PJM	4,500 MW	67%
Midwest ISO	4% of load	65%
MAPP	871 MW	65%
SPP	1,746 MW	65%
Entergy	4% of load	65%
Southern	4% of load	65%
TVA	4% of load	65%
VACAR	4% of load	65%
FRCC	853 MW	65%
Ontario	1,600 MW	55%

E. Marginal transmission Losses: GE MAPS has the capability of simulating marginal losses and their impact on locational energy prices. However these analyses do not include marginal losses in any calculations.

### APPENDIX I: CAPACITY BALANCE

ISO-NE	2006	2007	2008	2009	2010	2011
	28,583	29,016	29,449	29,850	30,230	30,624
Forecast Peak (MW)	1,485	1,534	1,566	1,571	1,534	1,450
Interruptible Load (MW)	27,098	27,482	27,883	28,279	28,696	29,174
Net Demand (MW)	15	15	15	15	15	15
Reserve Margin (%)						
Load + Reserve (MW)	31,163	31,604	32,065	32,521	33,000	33,550
Firm Transfers (MW)	463	463	463	463	456	456
Installed Capacity (MW)	31,267	30,917	31,433	31,433	31,433	32,933
Capacity Surplus (MW)	567	-224	-169	-625	-1,111	-161
	1					
NYISO	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	15,739	15,913	16,061	16,243	16,430	16,632
Interruptible Load (MW)	137	137	137	142	142	147
Net Demand (MW)	15,602	15,776	15,924	16,101	16,288	16,485
Reserve Margin (%)	18	18	18	18	18	18
Load + Reserve (MW)	18,410	18,616	18,790	18,999	19,220	19,452
Firm Transfers (MW)	-225	-225	-305	-305	-298	-298
Installed Capacity (MW)	24,058	23,735	23,247	23,247	23,247	23,247
Capacity Surplus (MW)	5,423	4,894	4,152	3,943	3,729	3,497
New York City	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	11,505	11,660	11,805	11,965	12,090	12,217
Interruptible Load (MW)	71	71	71	74	74	76
Net Demand (MW)	11,434	11,589	11,734	11,891	12,016	12,141
Reserve Margin (%)	-20	-20	-20	-20	-20	-20
Load + Reserve (MW)	9,147	9,271	9,387	9,513	9,613	9,713
Firm Transfers /M/A/A	_					-,
Firm Transfers (MW)	0	0	0	0	0	0
Installed Capacity (MW)	10,325	10,550	9,695	0 9,695	9,530	
Installed Capacity (MW)						0
	10,325	10,550	9,695	9,695	9,530	0 10,030
Installed Capacity (MW)	10,325	10,550	9,695	9,695	9,530	0 10,030
Installed Capacity (MW) Capacity Surplus (MW)	10,325 1,178	10,550 1,279	9,695	9,695 182	9,530	0 10,030 317
Installed Capacity (MW) Capacity Surplus (MW) Long Island	10,325 1,178 <b>2006</b>	10,550 1,279 <b>2007</b>	9,695 308 <b>2008</b> 5,500 71	9,695 182 <b>2009</b>	9,530 -83 <b>2010</b>	0 10,030 317 <b>2011</b>
Installed Capacity (MW) Capacity Surplus (MW)  Long Island Forecast Peak (MW) Interruptible Load (MW)	10,325 1,178 <b>2006</b> 5,320	10,550 1,279 <b>2007</b> 5,410	9,695 308 <b>2008</b> 5,500	9,695 182 <b>2009</b> 5,580	9,530 -83 <b>2010</b> 5,680	0 10,030 317 <b>2011</b> 5,779
Installed Capacity (MW) Capacity Surplus (MW)  Long Island Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW)	10,325 1,178 2006 5,320 71	10,550 1,279 <b>2007</b> 5,410 71	9,695 308 <b>2008</b> 5,500 71	9,695 182 <b>2009</b> 5,580 74	9,530 -83 <b>2010</b> 5,680 74	0 10,030 317 <b>2011</b> 5,779 76
Installed Capacity (MW) Capacity Surplus (MW)  Long Island Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%)	10,325 1,178 2006 5,320 71 5,249	10,550 1,279 2007 5,410 71 5,339	9,695 308 <b>2008</b> 5,500 71 5,429	9,695 182 <b>2009</b> 5,580 74 5,506	9,530 -83 <b>2010</b> 5,680 74 5,606	0 10,030 317 <b>2011</b> 5,779 76 5,703
Installed Capacity (MW) Capacity Surplus (MW)  Long Island Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW)	10,325 1,178 2006 5,320 71 5,249 -1	10,550 1,279 2007 5,410 71 5,339 -1	9,695 308 2008 5,500 71 5,429 -1	9,695 182 2009 5,580 74 5,506	9,530 -83 <b>2010</b> 5,680 74 5,606	0 10,030 317 <b>2011</b> 5,779 76 5,703
Installed Capacity (MW) Capacity Surplus (MW)  Long Island Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%)	10,325 1,178 2006 5,320 71 5,249 -1 5,197	10,550 1,279 2007 5,410 71 5,339 -1 5,286	9,695 308 2008 5,500 71 5,429 -1 5,375	9,695 182 2009 5,580 74 5,506 -1 5,451	9,530 -83 <b>2010</b> 5,680 74 5,606 -1 5,550	0 10,030 317 <b>2011</b> 5,779 76 5,703 -1 5,646

MAAC	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	58,784	59,909	61,025	62,136	63,244	64,368
Interruptible Load (MW)	803	793	793	793	793	793
Net Demand (MW)	57,981	59,116	60,232	61,343	62,451	63,575
Reserve Margin (%)	16	16	16	16	16	16
Load + Reserve (MW)	67,258	68,575	69,869	71,158	72,443	73,747
Firm Transfers (MW)	0	0	0	0	0	0
Installed Capacity (MW)	69,249	68,801	69,591	69,591	69,591	73,591
Capacity Surplus (MW)	1,991	226	-278	-1,567	-2,852	-156
	•	•	•	•		
ECAR	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	106,753	108,749	110,942	112,867	114,598	116,432
Interruptible Load (MW)	2,523	2,499	2,519	2,520	2,475	2,395
Net Demand (MW)	104,230	106,250	108,423	110,347	112,123	114,037
Reserve Margin (%)	15	15	15	15	15	15
Load + Reserve (MW)	119,865	122,188	124,686	126,899	128,941	131,143
Firm Transfers (MW)	0	0	0	0	0	0
Installed Capacity (MW)	128,202	129,835	130,593	130,871	130,871	132,411
Capacity Surplus (MW)	8,338	7,648	5,907	3,972	1,930	1,268
MAIN	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	60,184	61,518	62,608	63,645	64,641	65,644
Interruptible Load (MW)	3,453	3,466	3,471	3,476	3,479	3,483
Net Demand (MW)	56,731	58,052	59,137	60,169	61,162	62,161
Reserve Margin (%)	17	17	17	17	17	17
Load + Reserve (MW)	66,375	67,921	69,190	70,398	71,560	72,728
Firm Transfers (MW)	-61	-69	-141	-143	-54	-56
Installed Capacity (MW)	68,486	68,546	69,506	70,973	72,364	72,614
Capacity Surplus (MW)	2,050	556	175	432	750	-170
	•	•	•	•		
MAPP	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	30,712	31,288	31,939	32,492	33,070	33,722
Interruptible Load (MW)	270	271	272	273	274	275
Net Demand (MW)	30,442	31,017	31,667	32,219	32,796	33,447
Reserve Margin (%)	15	15	15	15	15	15
Load + Reserve (MW)	35,008	35,670	36,417	37,052	37,715	38,464
Firm Transfers (MW)	1,151	1,132	1,203	1,198	1,210	1,222
i iiiii i ialisicis (ivivv)						
Installed Capacity (MW)	34,309	34,592	36,352	37,043	37,043	37,643

SPP	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	42,196	42,893	43,465	44,312	45,274	45,579
Interruptible Load (MW)	934	943	967	1,007	1,004	1,005
Net Demand (MW)	41,262	41,950	42,498	43,305	44,270	44,574
Reserve Margin (%)	15	15	15	15	15	15
Load + Reserve (MW)	47,451	48,243	48,873	49,801	50,911	51,260
Firm Transfers (MW)	450	485	442	319	49	-40
Installed Capacity (MW)	56,183	56,183	56,183	56,183	57,033	57,033
Capacity Surplus (MW)	9,182	8,426	7,752	6,701	6,172	5,733
, , , , , , , , , , , , , , , , , , , ,		I.	I.	I.	I.	
Entergy	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	28,360	28,858	29,422	29,654	30,090	30,742
Interruptible Load (MW)	465	460	469	472	464	471
Net Demand (MW)	27,895	28,398	28,953	29,182	29,626	30,271
Reserve Margin (%)	15	15	15	15	15	15
Load + Reserve (MW)	32,079	32,658	33,296	33,559	34,070	34,812
Firm Transfers (MW)	0	0	0	0	0	0
Installed Capacity (MW)	46,467	47,066	47,866	47,866	47,866	47,866
Capacity Surplus (MW)	14,388	14,408	14,570	14,307	13,796	13,054
Southern	2006	2007	2008	2009	2010	2011
Southern Forecast Peak (MW)	<b>2006</b> 48,312	<b>2007</b> 49,629	<b>2008</b> 50,857	<b>2009</b> 52,066	<b>2010</b> 53,240	<b>2011</b> 54,448
			50,857 138			54,448 138
Forecast Peak (MW)	48,312	49,629	50,857	52,066	53,240	54,448
Forecast Peak (MW) Interruptible Load (MW)	48,312 138 48,174 15	49,629 138 49,491 15	50,857 138 50,719 15	52,066 138 51,928 15	53,240 138 53,102 15	54,448 138
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW)	48,312 138 48,174	49,629 138 49,491	50,857 138 50,719	52,066 138 51,928	53,240 138 53,102	54,448 138 54,310
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%)	48,312 138 48,174 15 55,400	49,629 138 49,491 15 56,915	50,857 138 50,719 15 58,327	52,066 138 51,928 15 59,717	53,240 138 53,102 15 61,067	54,448 138 54,310 15 62,457
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW)	48,312 138 48,174 15 55,400	49,629 138 49,491 15 56,915	50,857 138 50,719 15 58,327	52,066 138 51,928 15 59,717	53,240 138 53,102 15 61,067	54,448 138 54,310 15 62,457
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW)	48,312 138 48,174 15 55,400	49,629 138 49,491 15 56,915	50,857 138 50,719 15 58,327	52,066 138 51,928 15 59,717	53,240 138 53,102 15 61,067	54,448 138 54,310 15 62,457
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW)	48,312 138 48,174 15 55,400 0 65,102	49,629 138 49,491 15 56,915 0 65,105	50,857 138 50,719 15 58,327 0 65,105	52,066 138 51,928 15 59,717 0 65,105	53,240 138 53,102 15 61,067 0 65,105	54,448 138 54,310 15 62,457 0 65,105
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702	49,629 138 49,491 15 56,915 0 65,105 8,190	50,857 138 50,719 15 58,327 0 65,105	52,066 138 51,928 15 59,717 0 65,105	53,240 138 53,102 15 61,067 0 65,105	54,448 138 54,310 15 62,457 0 65,105
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757	49,629 138 49,491 15 56,915 0 65,105 8,190 <b>2007</b> 32,411	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848	52,066 138 51,928 15 59,717 0 65,105 5,388 <b>2009</b> 33,641	53,240 138 53,102 15 61,067 0 65,105 4,038	54,448 138 54,310 15 62,457 0 65,105 2,649 <b>2011</b> 35,035
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155	49,629 138 49,491 15 56,915 0 65,105 8,190	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981	52,066 138 51,928 15 59,717 0 65,105 5,388 <b>2009</b> 33,641 1,992	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002	54,448 138 54,310 15 62,457 0 65,105 2,649
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)  TVA Forecast Peak (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155 29,602	49,629 138 49,491 15 56,915 0 65,105 8,190 2007 32,411 1,987 30,424	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981 30,867	52,066 138 51,928 15 59,717 0 65,105 5,388 2009 33,641 1,992 31,649	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002 32,174	54,448 138 54,310 15 62,457 0 65,105 2,649 <b>2011</b> 35,035 2,013 33,022
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)  TVA Forecast Peak (MW) Interruptible Load (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155 29,602 15	49,629 138 49,491 15 56,915 0 65,105 8,190 2007 32,411 1,987 30,424 15	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981 30,867 15	52,066 138 51,928 15 59,717 0 65,105 5,388 <b>2009</b> 33,641 1,992 31,649 15	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002 32,174 15	54,448 138 54,310 15 62,457 0 65,105 2,649 2011 35,035 2,013 33,022 15
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)  TVA Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155 29,602 15 34,042	49,629 138 49,491 15 56,915 0 65,105 8,190 2007 32,411 1,987 30,424 15 34,988	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981 30,867 15 35,497	52,066 138 51,928 15 59,717 0 65,105 5,388 <b>2009</b> 33,641 1,992 31,649 15 36,396	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002 32,174 15 37,000	54,448 138 54,310 15 62,457 0 65,105 2,649 2011 35,035 2,013 33,022 15 37,975
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)  TVA Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155 29,602 15 34,042	49,629 138 49,491 15 56,915 0 65,105 8,190 2007 32,411 1,987 30,424 15 34,988	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981 30,867 15 35,497	52,066 138 51,928 15 59,717 0 65,105 5,388 2009 33,641 1,992 31,649 15 36,396	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002 32,174 15 37,000 0	54,448 138 54,310 15 62,457 0 65,105 2,649 2011 35,035 2,013 33,022 15 37,975 0
Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW) Firm Transfers (MW) Installed Capacity (MW) Capacity Surplus (MW)  TVA Forecast Peak (MW) Interruptible Load (MW) Net Demand (MW) Reserve Margin (%) Load + Reserve (MW)	48,312 138 48,174 15 55,400 0 65,102 9,702 2006 31,757 2,155 29,602 15 34,042	49,629 138 49,491 15 56,915 0 65,105 8,190 2007 32,411 1,987 30,424 15 34,988	50,857 138 50,719 15 58,327 0 65,105 6,778 2008 32,848 1,981 30,867 15 35,497	52,066 138 51,928 15 59,717 0 65,105 5,388 <b>2009</b> 33,641 1,992 31,649 15 36,396	53,240 138 53,102 15 61,067 0 65,105 4,038 2010 34,176 2,002 32,174 15 37,000	54,448 138 54,310 15 62,457 0 65,105 2,649 2011 35,035 2,013 33,022 15 37,975

VACAR	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	61,224	62,512	63,735	64,944	66,141	67,402
Interruptible Load (MW)	2,228	2,223	2,216	2,208	2,199	2,190
Net Demand (MW)	58,996	60,289	61,519	62,736	63,942	65,212
Reserve Margin (%)	15	15	15	15	15	15
Load + Reserve (MW)	67,845	69,332	70,747	72,146	73,533	74,994
Firm Transfers (MW)	0	0	0	0	0	0
Installed Capacity (MW)	68,659	69,105	70,620	70,354	70,354	74,854
Capacity Surplus (MW)	814	-227	-127	-1,792	-3,179	-140
FRCC	2006	2007	2008	2009	2010	2011
Forecast Peak (MW)	47,994	49,139	50,414	51,700	53,030	54,370
Interruptible Load (MW)	3,386	3,381	3,386	3,384	3,405	3,425
Net Demand (MW)	44,608	45,758	47,028	48,316	49,625	50,945
Reserve Margin (%)	18	18	18	18	18	18
Load + Reserve (MW)	52,637	53,994	55,493	57,013	58,558	60,115
Firm Transfers (MW)	1,752	1,752	1,752	1,752	1,555	1,555
		E4 000	E2 C10	53,619	57,619	58,469
Installed Capacity (MW)	50,127	51,893	53,619	55,619	57,019	50,409



## Memorandum

To: Poonum Agrawal, David Meyer, Department of Energy CRA No.

From: Bruce Tsuchida, Alex Rudkevich CRA International

Date: Finalized: March 10, 2006

Subject: FUEL PRICE FORECAST

This memorandum documents the CRA fuel price forecast methodology used for the Department of Energy (DOE) Congestion Study and Designation of the National Interest Electric Transmission Corridors (NIETCs). The forecast includes prices for natural gas, distillate (#2) and residual (#6) fuel oil, and coal. Note that all prices are reported in real 2004 dollars.

#### **Base Case Forecasts**

#### 1. COAL PRICE FORECAST

Coal prices are drawn entirely from the Platts Coaldat database of January 2005, which forecasts delivered coal prices, including transportation and handling, for each major coal plant on an annual basis.

#### 2. FUEL OIL FORECAST

**Principal Drivers:** The principal drivers underlying this forecast are the projected price for light sweet crude oil at Cushing, Oklahoma.

**Base Case Forecast:** In the near term (through 2009), the Base Case forecast is derived from the NYMEX futures prices for light sweet crude oil as of the closing of November 3, 2005. For 2010 the forecast is an interpolation between the futures of 2009 and the 2011 Reference Case forecast from the EIA Annual Energy Outlook 2006 (AEO2006). Through 2030, CRA uses the AEO2006 Reference Case forecast. CRA Base Case forecast for light sweet crude oil is presented on Figure 1.

**Regional Prices:** CRA forecasts prices for fuel oil # 2 and #6 by US census region. This forecast is prepared in three steps. First CRA uses a regression model calibrated on historical data to derive prices for fuel oil #2 and #6 at New York Harbor from the forecast of crude oil prices. New York Harbor prices for the Base Case forecast are shown in Figure 5. Second, New York Harbor prices (both fuel oil #2 and fuel oil #6) are linked to the AEO Reference Case forecast of US average prices of each type of fuel oil used by electric utilities. This derivation is also based on historical regression. Finally, CRA uses AEO forecast

Fuel Price Forecast

Finalized: March 10, 2006

Page 2

to develop yearly regional multipliers linking national average prices and prices by census region. Petroleum Business Tax of \$0.45/MMBtu for fuel oil #6 and \$0.63/MMBtu for fuel oil #2 is added to oil prices for New York State.

**Seasonal Pattern:** Both fuel oil #2 and fuel oil #6 prices are varied monthly based on NYMEX futures data in the near term, and based on historical monthly patterns in the longer term.

Figures 7 through 17 show the regional fuel oil prices along with corresponding gas prices.

#### 3. NATURAL GAS FORECAST

Principal Drivers: The principal drivers are the projected prices for natural gas at Henry Hub.

**Base Case Forecast:** In the near term (through 2008), the Base Case forecast is set equal to NYMEX futures prices for natural gas at Henry Hub as of the closing of November 3, 2005. For 2009 the forecast is an interpolation between the 2008 futures and the 2010 Reference Case forecast from the AEO 2006<sup>1</sup>. Through 2030, CRA uses the AEO2006 Reference Case forecast. CRA Base Case forecast for natural gas prices at Henry Hub is shown in Figure 2.

**Regional Prices:** CRA forecasts gas price by state, which are aggregated to the regions as shown in Table 1. Regional forecasts are derived by adding two factors, the basis differential by region and local delivery charge by state, to the Henry Hub gas price.

Basis Differentials by Region: CRA recognizes multiple pricing points within each census region, all of which are actual pipeline trading points surveyed and reported by Platt's Gas Daily. Some of these pricing points coincide with the NYMEX Clearport hubs, which include Henry Hub. For the other points, CRA uses a regression model to one or several NYMEX Clearport hubs, calibrated with historical data, to derive a forecast. Table 1 shows the region, states, relevant natural gas trading points within the regions, and the NYMEX Clearport hubs used as drivers for the prices, either as directly or through historical regression. In the near term (through 2010), the basis forecast is derived from NYMEX Clearport hub futures settlement as of November 3<sup>rd</sup>, 2005. The NYMEX Clearport hub futures settlement data are only available for a short period, typically between 12 and 24 months. Within this timeframe, CRA derives summer and winter differentials to these hubs using NYMEX data. Beyond this period, CRA scales the basis differentials in proportion to the Henry Hub forecast. Forecast prices at each hub are derived using the Henry Hub forecast and the scaled basis differential for that hub.

<sup>1</sup> AEO 2006 does not forecast Henry Hub Prices, but predicts prices at the wellhead instead. A historical multiplication factor of 1.129 is used to derive the Henry Hub price forecast.

Page 3

**Table 1: Natural Gas Pricing Points** 

Region	States	Natural Gas Trading Point	Weights	Deriving Source (Summer)
Eastern New York	NY (East)	Transco Zone 6 NYC	1	Direct NYMEX ClearPort Hub
Western New York	NY (West)	Dominion (Appalachia)	0.5	Direct NYMEX ClearPort Hub
Westellinew Tork	INT (WEST)	DAWN	0.5	Regressed to Michigan Basis
PJM	MD, NJ, PA (East)	Texas Eastern Zone M 3	0.5	Direct NYMEX ClearPort Hub
I JIVI	IVID, INJ, I A (Last)	Transco Zone 6 Non NYC		Regressed to Texas Eastern Zone M 3 and Transco Zone 6 NYC
	KY, OH, PA (West),	TCO Basis	00	Direct NYMEX ClearPort Hub
APR	WV	Leidy Hub		Regressed to Transco Zone 6 NYC
		Dominion (Appalachia)		Direct NYMEX ClearPort Hub
Southern New England	CT, MA, RI	Algonquin City Gates	1	Regressed to Transco Zone 6 NYC
Northern New England	ME, NH, VT	Tennessee Zone 6		Regressed to Texas Eastern Zone M 3 and Transco Zone 6 NYC
Ttorthom Ttow England	W.E., 1411, V 1	Dracut		Regressed to Dominion (Appalachia)
Iowa-Missouri-Nebraska	IA, MO, NE	Ventura	1	Direct NYMEX ClearPort Hub
Florida	FL	Florida CityGate		Regressed to Henry Hub
Mid-Continent	KS, OK	NGPL Mid-Continent Basis	1	Direct NYMEX ClearPort Hub
Midwest	IL, IN, ,MI, MN, ND,	Chicago Basis	0.5	Direct NYMEX ClearPort Hub
Midwest	SD, WI	Michigan Basis	0.5	Direct NYMEX ClearPort Hub
Ontario East	ON (East)	Niagra	1	Regressed to Dominion (Appalachia) and Michigan Basis
Ontario West	ON (West)	DAWN		Regressed to Michigan Basis
		Texas Eastern Zone M 3	0.16667	Direct NYMEX ClearPort Hub
	DC, DE, GA, MD, NC,	Transco Zone 6 Non NYC	0.16667	Direct NYMEX ClearPort Hub
South Atlantic East	SC, VA	TRS85	0.16667	Regressed to Transco Zone 3
	00, VA	TETM1		Regressed to East LA Basis
		FGTMB	0.33333	Regressed to Transco Zone 3
South Atlantic South	AL, AR, LA, MS, TN	Henry Hub	1	Direct NYMEX ClearPort Hub

**Local Delivery Charges:** Burner tip prices for natural gas are the sum of the basis differentials by region as derived above and a local component that captures pipeline lateral charges and/or charges to local distribution companies. CRA estimates this local component at \$0.07/MMBtu for all units.

**Seasonal Pattern:** Natural gas prices are varied seasonally based on NYMEX futures data in the near term (through 2010). Beyond 2010, the seasonal pattern shown in 2010 is repeated for each year.

Figure 6 compares the Base Case gas price forecast by region.

Figures 7 through 17 show the regional gas prices along with corresponding oil prices.

### **Sensitivity Case Forecasts**

For both light sweet crude oil and natural gas, CRA has derived a High Case forecast and Low Case forecast using the methods discussed below. Table 2 shows the values for these two forecasts along with the Base Case forecast. The CRA approach to constructing High and Low Cases relies on the same source that used for developing the Base Case: the forward market data and the fundamentals driven AEO 2006 forecasts. Coal prices were assumed to remain constant in all three cases.

Forward Market Data: NYMEX futures do not explicitly provide sensitivity scenarios. However, implied volatility could be derived from futures and options prices. CRA used implied volatility to estimate a standard deviation of forward prices. Then the High Case was set as futures plus one standard deviation. Similarly, the Low Case could be defined as futures minus one standard deviation. The Low Case for near terms was set as futures minus one standard deviation.

Fuel Price Forecast

Finalized: March 10, 2006

Page 4

AEO 2006 Forecasts: In the long term, the AEO 2006 LP Case forecast was used for the Low Case. The AEO 2006 HP Case forecast appeared to be too low and thus was not used.

CRA developed sensitivity scenarios for the year 2008 through 2015, consistent with the proposed timeframe for the Congestion Study.

**High Case Forecast:** For both, light sweet crude oil and natural gas, the "futures plus standard deviation" approach was applied for years 2008 through 2015. These forecasts are shown on Figures 4 and 5 for light sweet crude oil and natural gas, respectively.

**Low Case Forecast:** For crude oil, the AEO 2006 LP Case prices were used in all years, because the prices generated by the "futures minus standard deviation" approach appear to be too low. For natural gas, the "futures minus standard deviation" approach was applied for 2008, the AEO 2006 LP Case was applied for years 2010 and beyond, and the price for 2009 was derived as a midpoint between 2008 and 2010. These forecasts are shown on Figures 4 and 5 for light sweet crude oil and natural gas, respectively.

**Regional Prices:** For light sweet crude oil the regression coefficients used for the Base Case forecast was applied for both the High and Low Case forecasts. For natural gas basis differential by region is calculated using the same methodology as the Base Case forecast but because outer year differentials will be scaled proportional to the Henry Hub forecast, the values of the High and Low Case vary from the Base Case.

**Table 2: Forecast Comparison** 

Year	Natural Gas Forecast (\$/MMBtu)						Light Sweet Crude Oil Forecast (\$/BBI)					
	Base Case		High Case		Low Case		Base Case		High Case		Low Case	
2008	\$	7.46	\$	9.53	\$	5.39	\$	55.68	\$	82.42	\$	45.48
2009	\$	6.49	\$	8.29	\$	5.17	\$	52.37	\$	83.18	\$	41.23
2010	\$	5.52	\$	7.68	\$	4.94	\$	48.08	\$	80.73	\$	37.00
2011	\$	5.27	\$	7.80	\$	4.62	\$	43.78	\$	77.02	\$	35.23
2012	\$	5.20	\$	8.09	\$	4.42	\$	43.59	\$	79.84	\$	33.55
2013	\$	5.18	\$	8.40	\$	4.30	\$	43.39	\$	82.37	\$	31.96
2014	\$	5.20	\$	8.73	\$	4.21	\$	43.20	\$	84.68	\$	30.44
2015	\$	4.99	\$	8.65	\$	3.99	\$	43.00	\$	86.80	\$	28.99



